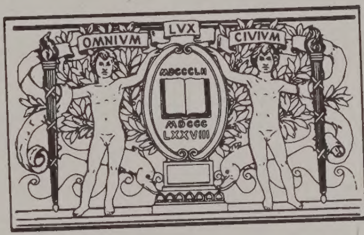
A Heritage of Service: Seventy-Five Years of Military Aviation at Kelly Air Force Base 1916 - 1991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A Heritage of Service:

Seventy-Five Years of Military Aviation

at

Kelly Air Force Base

1916 - 1991

by
Ann Krueger Hussey
Dr. Robert S. Browning III
Sergeant Michael J. Obert
Elizabeth A. Manning

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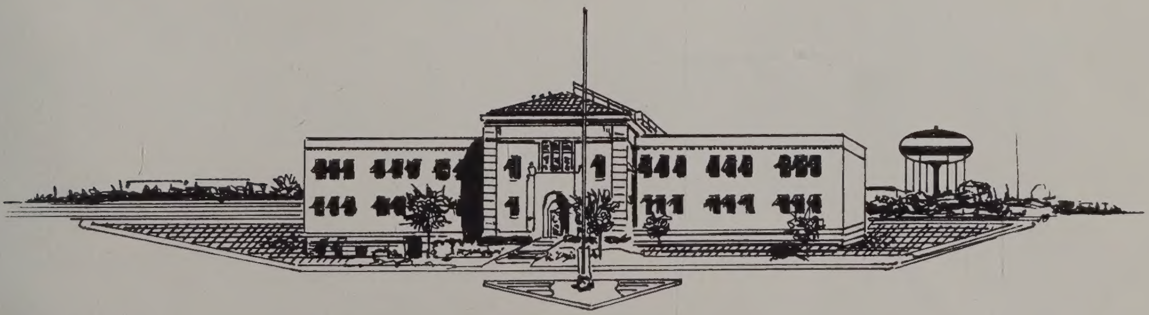

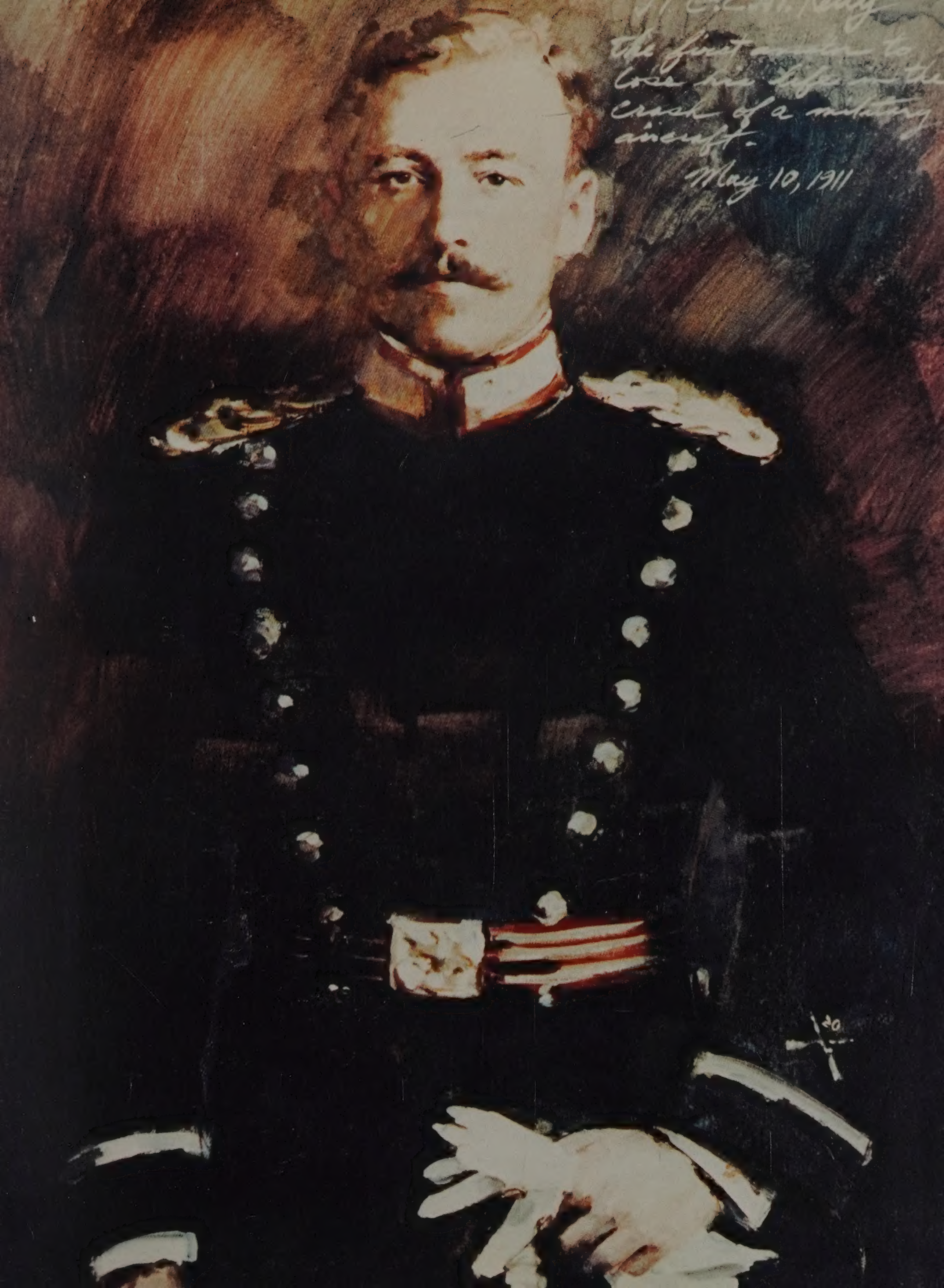
G.E.M. Kelly
the first man to
lose his life in the
crash of a military
aircraft.
May 10, 1911

KELLY AFB
1916
75
1991
A Tradition of Excellence

Preface

This is the second edition of the "Pictorial History of Kelly Air Force Base." The first edition appeared in 1985 and covered the history of the base through 1980. It brought together in print for the first time much of the rich heritage of Kelly and triggered a steady stream of additional contributions in the form of photographs, memorabilia, and artifacts that added further insight and depth to the Kelly story.

Kelly Air Force Base does indeed have a rich heritage. Its site was selected by Major Benjamin Foulois in November 1916, and it was named in 1917 for Lieutenant George E. M. Kelly, the first American military aviator to die in the crash of a military aircraft. The first aircraft landed at the field on April 5, 1917, a day before the United States entered World War I. Kelly is the oldest, continuously active military airfield in the United States Air Force, and for over seventy-five years has been an important, sometimes critical, part of American military aviation. The leaders who built the Army Air Forces of World War II and fought successfully for an independent Air Force all spent time at Kelly, as commanders, pilots, instructors, or cadets. Since the removal of pilot training during World War II, Kelly has played an equally vital role in sustaining American military airpower through its logistics and management missions. More than the largest employer in the South Texas area, Kelly is a key part of American defense. The thousands of men and women who have served at Kelly have all played a role in that defense, which for nearly fifty years kept the peace and made possible the momentous, on-going changes in world politics which are literally reshaping the global map.

Kelly's story is an important one, and this volume tells it in a way which is interesting and eye-catching. To a large extent we relied on the groundwork done by our predecessors in this office and used many of the same sources. Among the secondary works we used was "Kelly Field in the Great World War," a yearbook edited by Lieutenant H. D. Kroll and published in 1919. Equally useful were archival sources such as the "Kelly Field Eagle," the field's paper in World War I. Masters theses by Mr. William C. Boden, St. Mary's University, and Frances Wyatt Isbell, Trinity University, also proved useful, and the base newspapers published since 1944, "The Flying Times" (the title until 1965) and "Kelly Observer " (1965 to the present) were invaluable. Retired Brigadier General George Beverley's autobiography offered insight into activities at the field in the 1930s, and the memoirs of Benjamin Foulois offered a useful starting point. Special mention should also be made of Mr. Lee Arbon, editor of the Sergeant Pilots Association newsletter, who never failed to bring something new to our attention each time he called or visited.

Over the past several years research by several other historians has continued to integrate new information into the existing record. Much of this work was accomplished by reserve officers Lieutenant Colonel Michael L. Lobb and Lieutenant Colonel Juan Montoya. Their effforts have uncovered new material on Kelly's past and, in some cases, rectified errors in the historical record. Most of our research, however, was in the growing archive collection of the Office of History, including the annual histories produced here since 1942. Information was also collected from other sources, particularly the National Archives, which yielded such gems as the diary of the 3rd Aero Squadron which opened Kelly Field in 1917. In addition, letters, photographs, and memorabilia continue to come in, all adding to our knowledge of Kelly's past and enriching our understanding of our heritage.

Contributors to the current volume include every historian who has served at Kelly, but the authors of this work were primarily Ms. Ann Krueger Hussey, who wrote chapters five and seven and Dr Robert S. Browning, who wrote chapters one through four, six, and eight. Sergeant Michael J. Obert, staff historian, assisted in collecting photographs and wrote several of the text boxes. The physical layout of this publication is the product of Ms. Elizabeth Manning, who performed the arduous task of arranging text and photographs into copy suitable for printing. Various stages of the manuscript were proofread by Ms. Shannon Wickliffe, University of Texas at Austin, and Ms. Janet Gieselman, San Antonio Air Logistics Center's Directorate of Financial Mangement. For all of us, it was a labor of affection, and we are grateful to everyone who contributed their time, knowledge, insight, and humor. By allowing us to capture something of the spirit of Kelly's past, their generosity has made this volume far better than it otherwise would have been. Any errors of fact or interpretation belong to us alone.

Ann Hussey
Ann Krueger Hussey
Chief, Office of History

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PROLOGUE

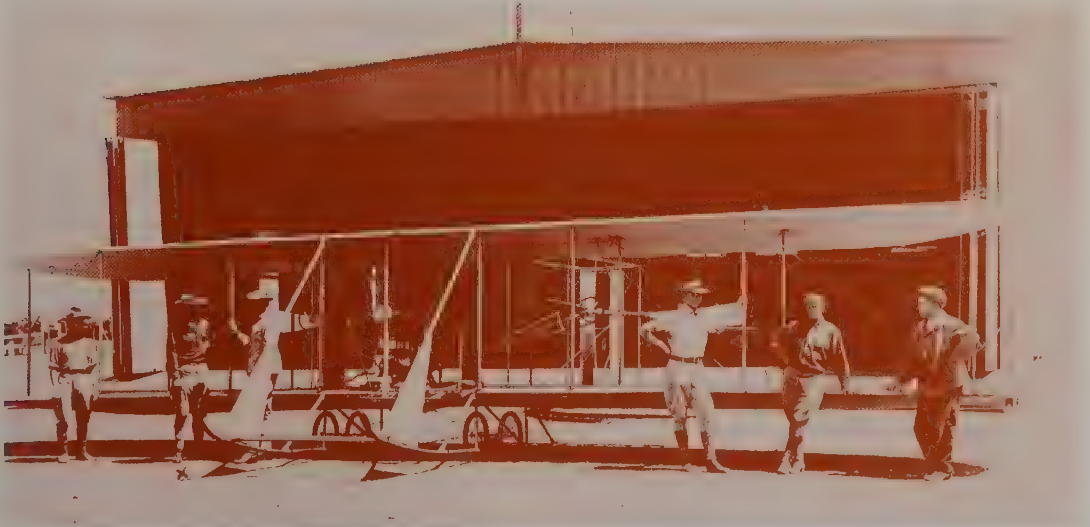
INTO THE AIR

Military Aviation in San Antonio, 1910-1915

At Kitty Hawk, North Carolina, the morning of December 17, 1903, was cold and windy. With the assistance of four men from a nearby United States (U.S.) Lifesaving Station, two brothers from Dayton, Ohio, maneuvered an ungainly contraption from its shed, mounted it atop a rail, and started its small engine. "After running the engine and propellers a few minutes," recorded Orville Wright, "I got on the machine at 10:35 for the first trial." At his signal, the men loosened the rope holding the machine and it started off down the rail, gathering speed and then lifting into the air. The flight was brief, lasting only about twelve seconds and covering only 100 feet, but it represented the first time a man-made, heavier-than-air machine had flown under its own power. Although in four attempts that day--the longest flight was barely over 850 feet and lasted less than a minute--Wilbur and Orville Wright had realized the centuries of old dream of manned flight, opening a new era in history.

Recognition of the Wrights achievement was slow. Their claims were met with skepticism, disbelief, and even disinterest. During 1904 and 1905, the Wrights continued to improve their aircraft, twice offering it to the U.S. Army. However, the Board of Ordnance and Fortification refused to specify the requirements for a flying machine until President Theodore Roosevelt intervened and ordered Secretary of War William Howard Taft to investigate the potential of such a machine. In late December 1907, the War Department called for bids on an aircraft that would carry two people at forty miles-per-hour for a distance of 125 miles. The Wrights offered to build such an aircraft for $25,000. In August 1908, they arrived at Fort Myer, Virginia, with the plane for a series of preacceptance tests.

The test flights began on September 3, 1908, thrilling local spectators. But on September 17 the plane crashed, injuring Orville Wright and killing his passenger, Lieutenant Thomas E. Selfridge. The



Aviation in San Antonio began with the arrival of a Wright Type-B airplane at Fort Sam Houston in 1910. Shown with the Army's third airplane are (left to right); Cpl. Vernon Burge, Pvt. Kenneth L. Kintsel, Sgt. Herbert Marcuse, 1st Lt. Benjamin Foulois, and Oliver G. Simmons (civilian mechanic).

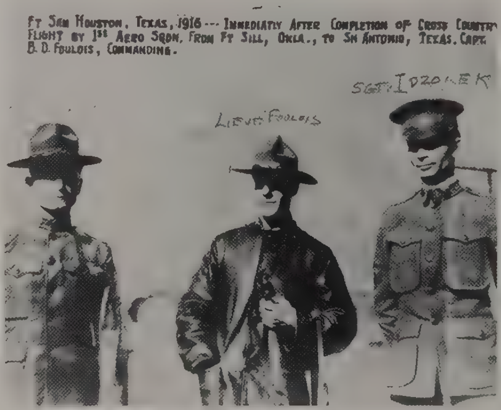
Facing Page: Benjamin D. Foulois

One of the earliest flying schools was established by aviation pioneer Glenn H. Curtiss at North Island, San Diego, California. Shown are students (left to right) George E.M. Kelly, Paul W. Beck, Curtiss, Charles J. Witmer, John C. Walker, and Theodore G. Ellyson.

Wrights were unable to return to Fort Myer until June 1909. On July 27, Orville Wright, now recovered from his injuries, took Lieutenant Frank P. Lahm as a passenger on the first official test flight. Three days later, with Lieutenant Benjamin D. Foulois as a passenger, Orville flew five miles to Alexandria, Virginia, averaging 42.5 miles-per-hour. The Army accepted the plane, which became Aeroplane Number 1, on August 2, 1909.

As part of the original contract, the Wrights agreed to train two Army pilots to fly Number 1. During October, Wilbur trained Lieutenants Frank Lahm and Frederic E. Humphreys, both on detached duty from their regular branch. Both officers soloed on October 26. Lieutenant Foulois received some training, too, but had not soloed when Lahm and Humphreys crashed Number 1 in November. Neither was seriously hurt, but the plane was badly damaged, and both officers soon returned to their regular duties. As the plane underwent repair, the Army decided to relocate its flying center to Fort Sam Houston, Texas. Although he had not yet soloed, Foulois was the only Army officer on flying duty. He, a party of enlisted men, and Aeroplane Number 1 arrived in San Antonio in February 1910.

During February, Foulois and his men erected a small hangar on the mounted drill field at Fort Sam Houston and rebuilt the plane. On March 2, 1910, Foulois climbed aboard for what he recalled as "my first solo, landing, takeoff, and crash." This first flight of a military aircraft in Texas ended when a fuel pipe cracked, and Foulois was forced to make an emergency landing, damaging Number 1 enough to require a week of repairs. Ten days later, during the last of five flights, Foulois was nearly thrown out of the aircraft by a violent gust of wind. The next day he went to the saddlery shop of a nearby field artillery


FT SAN HOUSTON, TEXAS, 1916 --- IMMEDIATLY AFTER COMPLETION OF CROSS COUNTR
FLIGHT BY 1st AERO SQDN. FROM FT SILL, OKLA., TO SN ANTONIO, TEXAS. CAPT.
B. D. FOULOIS, COMMANDING.
SGT. IDZOREK
LIEUT. FOULOIS

Four years after flying was banned at Fort Sam Houston, Lieutenant Foulois brought his wandering band of aviationists back to San Antonio. Shown with Lieutenant Foulois (center) are Sgt. Vernon Burge (left) and Sgt. S.J. Idzorek. Idzorek was later commissioned and put in charge of the Mechanics School at Kelly Field.

unit and obtained a saddle strap which became the first Army aircraft seatbelt. Foulois carried on a steady correspondence with the Wright brothers, describing his actions and the resulting behavior of the aircraft. "I was the first, and only, pilot," he later recalled, "to learn to fly by mail." Foulois also installed wheels on Number 1, ending reliance on the cumbersome track arrangement used by the Wrights.

During the summer of 1910, Foulois and his small crew installed an electronic buzzer system on the Army's target range at Leon Springs, completed installation of their self-designed undercarriage, and continued their practice flying. In March 1911, a reluctant Congress appropriated $125,000 for Army aeronautics, and Major General James Allen, Chief of the Signal Corps, ordered five new planes.

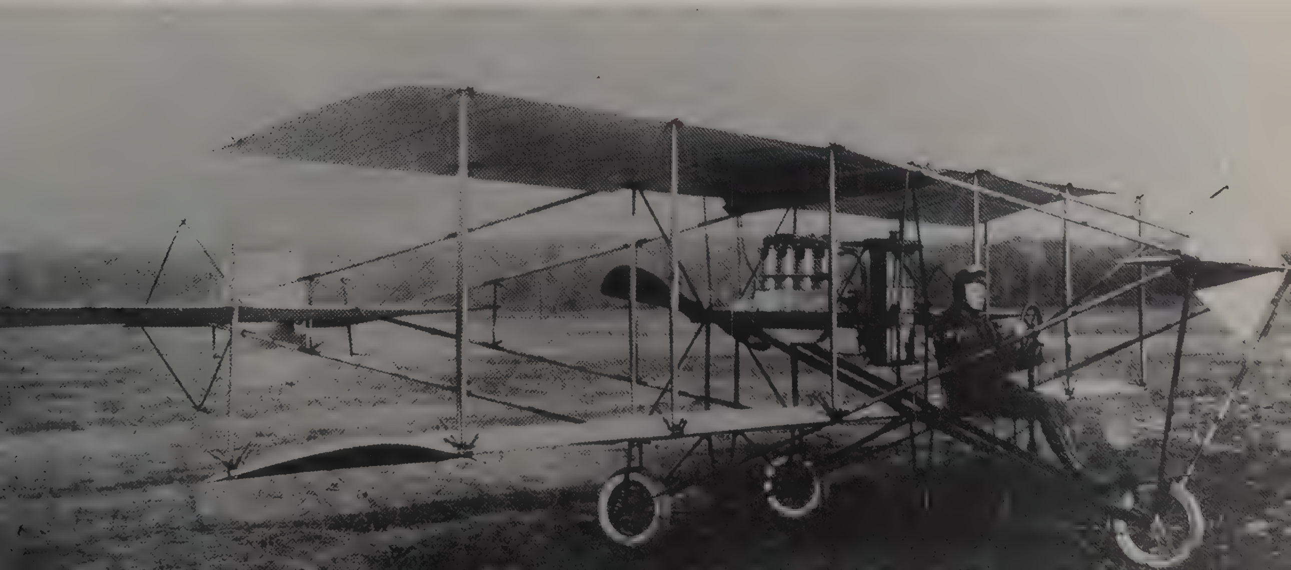
In the meantime, Foulois happily experimented with a Wright Type B aircraft loaned to the Army by millionaire publisher Robert Collier. Number 1 was retired before being restored to its original condition and turned over to the Smithsonian. Accompanied by pilot Philip Parmalee, a civilian employee of the Wrights, Foulois traveled to the border to participate in maneuvers. On a flight from Eagle Pass, Texas, back to Laredo, Parmalee accidentally shut off the engine and the plane glided to a rough crash landing in the Rio Grande. Both men emerged unhurt, but the Collier-owned airplane had to return to Fort Sam Houston in a wagon.

During the same period, pioneer aircraft designer Glenn Curtiss opened a flying school on North Island, California, just outside San Diego and invited all interested military officers to take free flying lessons at the school. Three Army officers, Lieutenants Paul W. Beck, John C. Walker, and George E. M. Kelly were assigned to the school. After a few hours of basic instruction at the Curtiss school, all three joined Foulois in San Antonio in April 1911. Their arrival coincided with the arrival of two civilian pilots--Frank T. Coffyn from the Wright factory and Eugene Ely from Curtiss--and two new aircraft, a Wright Type B "Flyer" similar to the Collier machine and a Curtiss D "Pusher."

Foulois over the Fort Sam Houston drill field in 1910.

Lieutenant Foulois believed that none of the three Army officers was completely ready to fly on his own.

A similar Curtiss Type-D pusher would crash at Fort Sam Houston on 10 May 1911. Lieutenant George E. M. Kelly would become San Antonio's first air fatality.



Since the Curtiss plane did not have dual controls, the young pilots had to teach themselves to fly, making many of the same mistakes made by Foulois in his own self-guided training program. Moreover, the control systems for the Wright and Curtiss machines were entirely different. The throttle of the Wright plane, for example, was a foot pedal that worked to vary the magneto spark firing the cylinders of the engine. Pressing the pedal actually slowed the spark, and the aircraft's speed. The Curtiss throttle was also a foot pedal, but it worked exactly opposite to the Wright system, with increased pedal pressure resulting in greater speed. Such distinctly different systems made it difficult to shift from aircraft to aircraft, especially for inexperienced pilots.

Ely and Coffyn began a series of flights in late April, with Coffyn taking Foulois up in the Wright to correct some remaining flaws in Foulois' landing technique. At the end of the month, Coffyn and Ely also began offering instruction to some eighteen young Army officers stationed at the post--including Lieutenants Horace E. Hickam and Leighton B. Hazelhurst, both of whom would have airfields named for them.

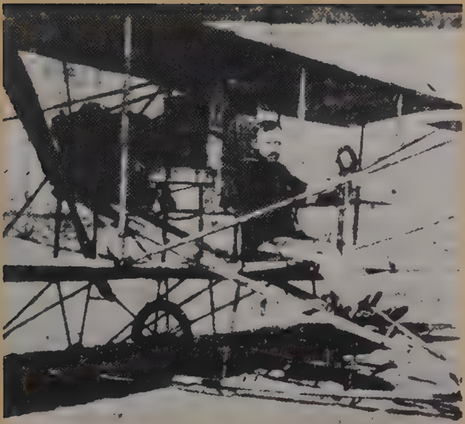
Up to this point, the activities of the small aeronautical group had been remarkably accident free, but their luck now began to run out. On May 2, Lieutenant Walker narrowly avoided a crash in the Curtiss D aircraft. Within days, Walker asked to be relieved from aviation duty. A day after Walker's near-calamity, Beck suffered an engine failure in the same Curtiss machine and crash-landed in the chaparral. Beck survived, although he was badly shaken up. This time the aircraft was severely damaged, and Curtiss mechanics spent a week repairing it.

Ellyson-Beck-Curtiss-Kelly-Walker

On May 10, 1911, Lieutenant Kelly took the Curtiss aircraft up for his first qualification flight. After taking Lieutenant Hickam for a brief instruction flight, Frank Coffyn was preparing to takeoff with Lieutenant Hazelhurst as a passenger, but waited while Kelly took off, made a brief circuit of the parade ground and came into land. Kelly was the least experienced of the three new Army pilots, and he came in too fast and at too steep an angle during his first landing attempt. After bouncing into the air again, Kelly tried a second time. This time he cut his engine power, but again he dove too steeply toward the ground. The aircraft struck nosewheel first, smashing the new front steering fork and rebounding briefly into the air. Seemingly headed toward a group of nearby tents, Kelly banked steeply in an apparent attempt to avoid them. He was too low. His wing dug into the ground, and the aircraft cartwheeled across the field in a flurry of broken wood and torn cloth. Thrown out as the plane crashed, Kelly died two hours later from a fractured skull.

Lieutenant Kelly was the first Army pilot to die while piloting an Army aircraft, and Foulois bitterly blamed Lieutenant Beck for not properly overseeing the repair of the Curtiss plane. A special board of officers was kinder, blaming a combination of pilot error and "an abrupt depression in the ground or some obstacle" for the tragedy.

The crash also had great impact on Major General William H. Carter, Commander of Fort Sam Houston, and already on record as declaring that airplanes were of no use to the Army. General Carter immediately prohibited further flying at his post. The month-old Provisional Aero Company disbanded, with all personnel and equipment returning to College Park, Maryland, under Beck's command. Lieutenant Foulois, the most experienced pilot in the Army, went to a desk job with the Militia Bureau of the War Department. Military aviation would not return to San Antonio until 1915.



English-born Lieutenant Kelly seated at the controls of a Curtiss Type D Pusher, the same type in which he met his untimely death. Unlike the Wright aircraft, the Curtiss plane was a single-seater, which meant that every flight was a solo flight.

Lieutenant George Edward Maurice Kelly was the first Army pilot to die while piloting an Army plane. His pioneering spirit remains alive at Kelly Air Force Base, a prime contributor to the Nation's defense.

George Edward Maurice Kelly

George Edward Maurice Kelly was born in London, England, on December 14, 1878. Educated at private schools, he emigrated to the United States in August 1896. For two years he lived in Great Falls, Montana, with two uncles, gaining some experience with machinery. When the Boer War broke out in 1899, Kelly attempted to enlist in the Canadian Mounted Rifles, but was rejected due to his light weight.

Kelly became a naturalized United States citizen in 1902. A year later, on a visit to New York City, he learned that he might be able to gain a commission in the United States Army from the enlisted ranks. In January 1904, Kelly signed up with the 84th Company of the Coast Artillery Corps. In February 1907, Quartermaster Sergeant Kelly got his commission as a 2nd Lieutenant in the 30th Regiment of Infantry.

Lieutenant Kelly's first service was in the Philippines. On his return, he visited China and saw relatives in England. Back in the United States in December 1909, Kelly was on duty at an aviation meet when he got the chance to make a balloon ascent. Benjamin Foulois was bitten by the aviation bug when he served with balloons, and this brief exposure apparently had the same effect on Kelly. By early 1911, he had obtained War Department approval to train at the Glenn Curtiss school at North Island, California.

Kelly did not stay long at North Island. By the end of April 1911, he had joined Foulois and several other fellow aviators at Fort Sam Houston. Less than two weeks later came his fatal crash.

Kelly was buried on May 15, 1911. An impressive procession traveled down New Braunfels Avenue from Fort Sam Houston to the National Cemetery. There Kelly was laid to rest with full military honors. His honorary pallbearers included his fellow pilots, Olin Ellis and Frederick Test. Active pallbearers came from among the enlisted men who served as mechanics, and included both Stephen Idzorek and Herbert Marcuse.

CHAPTER ONE

THE CRADLE OF THE AIR SERVICE

On November 4, 1916, Major Benjamin D. Foulois returned once again to San Antonio. He was acting in response to verbal orders from the Chief of the Aviation Section of the Signal Corps, Colonel George Squier, to find a site for a new flying field.

American Military Aviation, 1911-1917

The progress of Army aviation had been uneven in the five years since the transfer of Foulois and his small provisional squadron from Fort Sam Houston. A trickle of funds ensured that a small, but eager, number of young officers had access to flying training during 1912-1913. At the end of February 1913, the Army ordered the majority of available pilots to Texas City, Texas, under the command of Captain Charles DeForest Chandler. There they formed the 1st Aero Squadron. American relations with Mexico were tense in the aftermath of a revolution in which General Victoriano Huerta overthrew, and assassinated, Mexican President Francisco I. Madero. Huerta's opponents, including a one-time bandit named Francisco (Pancho) Villa, continued to fight with arms that often came from the United States. Angered by this, and by the refusal of the American government to recognize his regime, Huerta issued numerous threats, leading to an American military buildup along the border. The mission of the 1st Aero Squadron was to cooperate with the Army's 2nd Division. Fortunately, tensions eased in the early summer. Since the weather at Texas City was not conducive to regular flying, most of the men and planes moved to the small aviation school at North Island outside San Diego, California. Facilities there were better, but morale among the small group of aviators was often low, largely because they lacked a clearly defined status within the Army's organization. That issue was partially rectified when Congress created the Aviation Section of the Signal Corps in July 1914, with an authorized strength of sixty officers and 260 enlisted men. In addition, Congress authorized flight pay and established the official ratings of Junior Military Aviator (JMA) and Military Aviator.

he 1st aero Squadron's first
eroplane

Benjamin D. Foulois

Benjamin "Benny" D. Foulois was born in December 1879. At the age of 19 he enlisted in the United States Army as an engineer. In 1908, Foulois was assigned to the Office of the Chief Signal Officer. While assigned to this position, he operated the first dirigible balloon purchased by the government and was also one of the first U.S. Army officers to learn to fly.

In June 1910, he moved to Fort Sam Houston in San Antonio, Texas, with the sole airplane owned and used by the Army. At this point, Benny was the Army's only pilot, observer, navigator, instructor, and student.

During World War I, Foulois was named Chief of Air Service for the American Expeditionary Force (AEF) in France. During 1918, he served as Chief of the Air Service for the First Army; Assistant Chief of the Air Service, Zone of the Advanced AEF; and Assistant Chief of Air Service for the Services of Supply.

Foulois became Assistant to the Chief of the Air Corps in 1927. In June 1929, he went to Wilbur Wright Field, Ohio, as the Chief of the Materiel Division. He commanded the Air Corps Exercises of 1931, which earned him the Mackay Trophy. In December of the same year, he was promoted to the rank of major general and named the Chief of the Air Corps.

He retired in December 1935 after a long and distinguished career. In 1963,, Benjamin D. Foulois was the sixth person inducted into the National Aviation Hall of Fame, joining the likes of his mentor, Wilbur Wright.

In September 1914, Foulois took command of the 1st Aero Squadron, which moved from North Island to Fort Sill, Oklahoma, in July 1915. In November, the squadron completed its first major cross-country flight (although not non-stop) from Fort Sill to Fort Sam Houston. For a second time military aviation was present in San Antonio, but again its stay was brief. In March 1916, Pancho Villa raided the town of Columbus, New Mexico. In angry response, President Woodrow Wilson ordered Brigadier General John J. Pershing to lead a "Punitive Expedition" into Mexico to capture Villa. The 1st Aero Squadron left San Antonio for Columbus immediately to operate in conjunction with Pershing's troops.

The experience of the 1st Aero Squadron with Pershing's expedition was the first major field test for American military aviation, and it was soon clear that in terms of both numbers and equipment the squadron was utterly inadequate. The underpowered JN-2 aircraft could not clear the mountains of northern Mexico and had great difficulty in the winds at lower altitudes. Within a month only two planes were operational, and both were returned to Columbus, condemned, and destroyed. With World War I raging in Europe, and all the combatant powers fielding ever larger numbers of steadily improving aircraft, it was obvious that steps had to be taken to improve and expand American military aviation. In August 1916, Congress appropriated the unheard of sum of $13 million for aeronautics. In September, Foulois went to Washington to assist in aviation section planning, which focused on the creation of five aero squadrons in addition to the 1st (at Columbus, New Mexico) and the embryonic 2nd (at company strength in the Philippines); expansion of training facilities; and the acquisition of more advanced aircraft. Ordered to find a suitable location for at least two of the proposed squadrons and a training facility, Foulois could not envision it being "anywhere else but in San Antonio."

Men of the 1st Aero Squadron on the Mexican Border. Captain Benjamin Foulois is seated on running board.

Temporary barracks housed troops active in the construction of Camp Kelly.

Choosing the Site

Almost immediately after arriving in San Antonio, Foulois recognized that the former Remount Depot at Fort Sam Houston, the existing flying field at the post, was far too small to accommodate two squadrons equipped with more powerful aircraft. Within days he was searching for alternative locations with the enthusiastic support of the local Chamber of Commerce.

Nine days after Foulois arrived in the city, Brigadier General George P. Scriven, Chief of the Signal Corps, visited San Antonio while enroute to an inspection tour of the border units. Feted by the Chamber of Commerce, he and Foulois visited several of the prospective sites for the new post. The most attractive of these was a 700-acre tract about seven miles south of the city adjacent to the tracks of the Missouri-Pacific Railroad. In addition to the rail lines, which would simplify the shipment of material to the new post, the site Foulois favored was relatively flat, open farmland, with an artesian well to supply water. On November 21, 1916, Scriven passed back through San Antonio on his return from the border, examined the site, and gave Foulois instructions to proceed with the acquisition of leases for the land. By December 13, Foulois had the necessary lease agreements; and Senator Morris Sheppard of Texas was leading the effort to provide funds for the rental, and ultimate purchase, of the land.

Although construction on the new post awaited passage of the Sheppard Bill, War Department officials authorized leasing the land on January 11, 1917, and authorized a payment of $11,924.26 for a one-year lease on January 20. By this time personnel of the newly-formed 3rd Aero Squadron were already

Troops begin clearing cactus, mesquite, and rattlesnakes from the site that would eventually become Kelly Field.

Tent hangars sheltered Curtiss JN-4 "Jennies" during the first few months at Camp Kelly.

gathering at Fort Sam Houston under the command of Captain Thomas S. Bowen. On February 27, Foulois, already preparing to return to Washington, advertised for bids to clear and grub the land "between the Frio City Road and the GH & SA Railroad right of way, and from the large artesian well in the north end of the tract to Leon Creek." Mr. Ernest Koerner won the contract on March 10. Details from the 3rd Aero Squadron augmented his hired laborers in clearing and grubbing the land. Eight privates, one noncommissioned officer, and a cook were stationed permanently at the site in March to guard lumber piles and supplies, marking the first military occupation of the field.

Koerner also won the contract to build the first permanent buildings on the field. Years later, engineer George A. Williams recalled that in March 1917 he was "on my uppers" when he decided to pay a visit to his old college friend, Captain Townsend F. Dodd, at Fort Sam Houston. Dodd was in the process of taking over from Foulois as Aviation Officer for the Southern Department, and they were both present when Williams paid his visit. After Williams made his pitch for a job, Dodd and Foulois conferred briefly, and Dodd told Williams to return on Saturday. When Williams came back, he, Dodd, Foulois, and an unnamed quartermaster colonel drove out to the site. Williams recalled the quartermaster officer as saying, "Perhaps I am stretching my authority, but...go ahead." Dodd then handed Williams the plans for six concrete and steel hangars, and Williams began laying the foundations on March 27. Koerner had the contract to build the hangars, said Williams, "and I supervised their erection."

Few Americans had experience in building hangars in 1917, but Koerner was one of those few. In August 1915, he built two hangars at the Aviation Post at Fort Sam Houston as part of the preparations made in anticipation of the arrival of the 1st Aero Squadron from Fort Sill, Oklahoma.

Constructed of galvanized iron on a steel framework, these first hangars were actually modified railroad siding buildings with one eave of the steeply pitched roof much longer than the other. At the new field, Koerner simply placed two of these structures back-to-back to form each hangar, giving the roof line a unique sawtooth appearance still partially visible on a remaining building over seventy years later.

Soon after Camp Kelly was established, airplanes began arriving by rail.

Opening the New Field

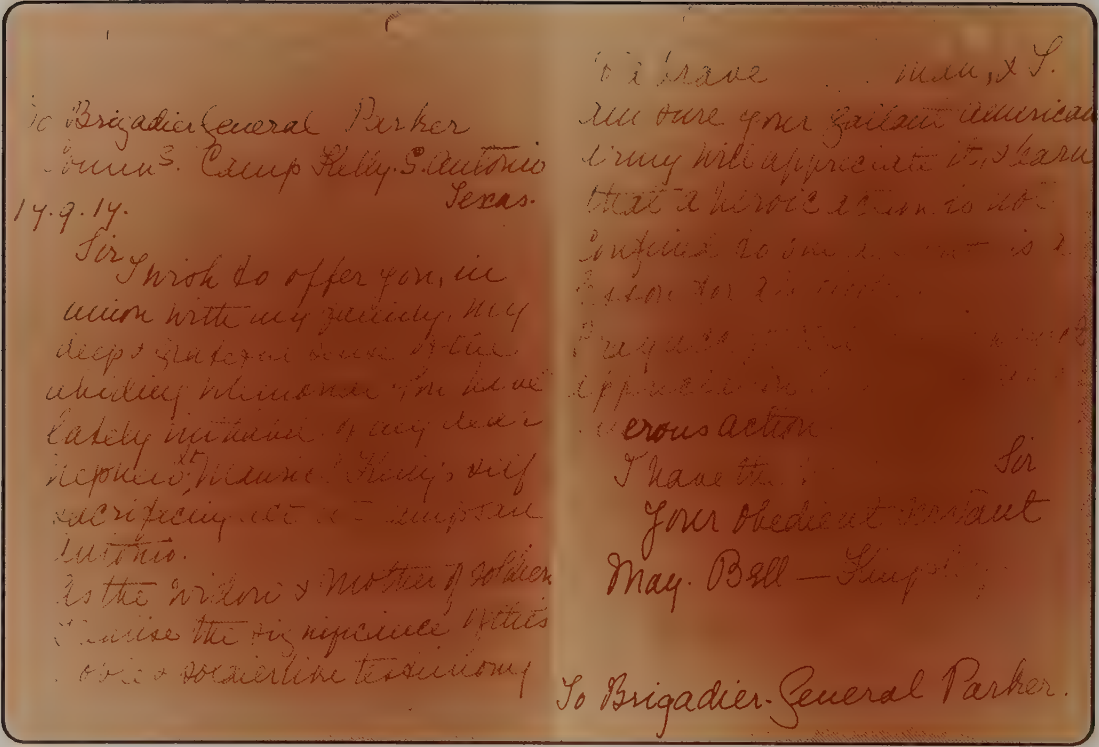
On April 5, 1917, with construction still underway, four JN-4 "Jennies" landed on the rough, dusty field. The pilots of the first four aircraft to use the new field included Captains George Reinburg and Bert Atkinson, recent arrivals from the 1st Aero Squadron, and Captain Carl Spaatz, whose name was consistently rendered as "Spotts" by the local press. Also piloting a plane that afternoon was Eddie Stinson of San Antonio, a civilian flying instructor whose sisters were the nationally known aviatrixes Marjorie and Katherine Stinson. Koerner's iron and steel hangars were still unfinished, and according to a popular legend, the flyers slept that night underneath the wings of their planes. The more prosaic truth is that the planes were housed in tent hangars, familiar to the pilots along the border, while the men were also quartered in tents. The following day the United States entered World War I.

Within days the new airfield was one of the busiest in the country. By the middle of May over 4,400 men were crowded onto the field. With the construction of wooden barracks and mess halls unable to keep pace with this growth, most of these men lived in ordered rows of pyramid-shaped tents, the number of which grew daily. Along with the 3rd Aero Squadron under Captain Thomas S. Bowen, the 4th Aero Squadron, commanded by Captain Bert Atkinson, and the 5th Aero Squadron, under Captain Carl Spaatz, the field was occupied by the Provisional

Troops began arriving by the thousands almost immediately.

Captain Thomas South Bowen

Thomas South Bowen graduated from the United States Military Academy at West Point in 1909. He commanded Company "B" of the 1st Aero Squadron at North Island near San Diego during 1914-1915 and continued in that capacity when the 1st Aero Squadron deployed to Fort Sill, Oklahoma, in the summer of 1915. He was one of the pilots on the historic flight of the 1st Aero Squadron from Fort Sill to Fort Sam Houston, Texas, on November 22, 1915. Bowen deployed with the squadron to the Mexican border for service with the Mexican Punitive Expedition. He returned to San Antonio with Major Benjamin Foulois in November to help organize the 3rd Aero Squadron. Under Bowen's command, the new squadron was the first to occupy Kelly Field in the spring of 1917.



To Brigadier General Parker
Comm^d. Camp Kelly. S. Antonio
Texas.
14.9.17.

Sir I wish to offer you, in union with my family, my deep & grateful sense of the abiding remembrance you have lately initiated of my dear nephew 2nd Lieut. Kelly's self sacrificing act of supreme [illegible].

As the widow & mother of soldiers I realise the significance of this noble & soldierlike testimony to a brave [illegible] man, & I am sure your gallant American Army will appreciate it, & learn that a heroic action is not confined to one [illegible] is a lesson for the [illegible]

[illegible]

appreciation [illegible]

[illegible]erous action

I have the [illegible] Sir

Your obedient servant
May. Bell—Kingsley

To Brigadier-General Parker.

Aviation Squadron, which acted as a reception center for the torrent of recruits. In June, when Lieutenant Colonel Charles E. Tayman arrived to take command, he discovered that he had only twenty-five officers and a handful of noncommissioned officers to assist him in organizing and controlling over 5,700 men.

One of Colonel Tayman's first steps was to name the new field. At his suggestion, on June 11, Brigadier General James Parker, Commander of the Southern Department, issued General Order Number 32, officially designating the "Aviation Camp, about five miles south of San Antonio...'Camp Kelly' in honor of Second Lieutenant George E. M. Kelly, 30th Infantry." Just over six weeks later, General Order Number 49 renamed the installation Kelly Field. Kelly's family in Ireland was deeply appreciative of this gesture by the U.S. Army. Kelly's aunt, May Bell-Kingsley, wrote a brief note to General Parker in September thanking him for the "noble and soldier-like testimony to a brave man."

Of more immediate concern was the decision of the Southern Department to further expand the training function at Kelly Field. In June, the Army directed the field to form an additional twenty-seven aero squadrons and announced plans to establish a supply depot and four more training camps in the San Antonio area. Although the Army intended to create other training centers at Fort Worth, Dallas, and Wichita Falls, Texas, Kelly Field was clearly intended to be the largest and most important aviation training facility in the country. Not only would this mean a further influx of recruits, it also forced officials in both San Antonio and Washington to recognize that the original site chosen by Foulois only seven months earlier was already too small.

Growth and Expansion

Local military officials immediately enlisted the San Antonio Chamber of Commerce in the quest for additional land. Anticipating the need for expansion, Major Townsend Dodd had obtained lease-options on approximately 1,800 acres of land adjacent to the north side of the original site. A committee of the Chamber of Commerce took the necessary steps to negotiate lease agreements more acceptable to government attorneys, determining fair rental values and persuading local landowners to yield to the terms. In mid-July 1917, the government agreed to the terms, and construction on this new portion of the field began on July 24.

The owner of one 200-acre tract was Emmett B. Cocke of San Antonio, who was amazed at the speed at which the contractors went to work. Briefly out of town for five days, he returned to find his tenants moved off the land, a large portion of the current cotton crop already chopped down, a small railroad spur laid from the main line to the artesian well, a barn cut in half, and one tenant cottage converted into a construction crew headquarters and drafting room. Government agents paid tenants a total of $1,700 for their crops and brought in 500 laborers to cut mesquite, level roadbeds for railroad tracks, and begin construction of foundations for the barracks and hangars at the field. Many people might be upset over the sudden loss of their land, but even years later Mr. Cocke saw it as "a blessing" that he was able to help in the emergency.

The newly acquired land north of the original site was soon unofficially known as Kelly Number 2, with the site first chosen by Foulois called Kelly Number 1. Kelly Number 2 was, in fact, designed from the beginning to accommodate double the number of hangars of a normal field. For a time portions of it, particularly an area of open fields adjacent to the north, were called Kelly Number 3, although this terminology disappeared during the war. In addition, the Air Service constructed three more fields around San Antonio, initially numbering each under the name Kelly Field and posing numerous difficulties for future historians. Kelly Number 4 was essentially an open field whose exact location has never been determined. Based on distances mentioned in old news articles and reminiscences, it was apparently several miles north-northwest of the main field, near the junction of today's Military Drive and Potranco Road. Kelly Number 6 was also a small auxiliary field with rudimentary refueling facilities and no permanent buildings. It was apparently located about two or three miles southeast of the main field, probably just north of the site of Palo Alto College. Kelly Number 5 had only a brief existence as one of the numbered fields before being renamed Brooks Field in February 1918. Cadet Sidney J. Brooks of San Antonio was the first fatal casualty at Kelly, crashing on November 13, 1917. After naming Brooks Field in his honor, the Air Service promptly leased the airfield owned by the Stinson family and began calling it Kelly Number 5. This rapid proliferation of numbers not only remains confusing today, but it simply reflects the near chaotic changes taking place throughout the American military as it geared up for war.

Sam Evers, aboard his Alice Chalmers tractor, levels the air strip at Kelly Field Number 2. In 1917, Evers was paid $25 a day for each of the five tractors he used in the construction.

Standardizing Air Field Construction

In the spring of 1917, Colonel C. G. Edgar of the Aviation Section Construction Division, visited Camp Borden, Ontario, a Canadian flying field. Through his "old boy" connections, he obtained copies of the plans for the camp from an old friend, Oscar Filley, and hired noted Detroit architect Alfred Kahn to redraft these plans. Using Kahn's designs, Edgar then hired Stone and Webster to build twenty-four flying fields throughout the United States--including Kelly Number 2--each one a duplicate of the fifty-four wooden buildings at Camp Borden. According to Kahn's design, each field had twelve wooden hangars with flattened gambrel roofs and sliding doors hanging on a monorail at each end. Kelly Number 2 was a "two field" unit and thus had twice the number of hangars and support buildings. Hangar Number 9 at Brooks Air Force Base, Texas, is an existing example of an Edgar-built World War I style hangar.

The contractor for the construction of facilities on Kelly Number 2 was Stone and Webster, a Massachusetts firm. Under the supervision of War Department representative Lieutenant E. L. Deacon, this company would eventually erect over 100 buildings on the field, including twenty-four hangars, twelve large barracks, officers' quarters, mess halls, repair shops, garages, and administrative buildings. This long array of buildings ran a mile-and-a-half east to west along a road from the site of today's operations hangar to the current location of the Texas Air National Guard facilities. Up to 6,000 men were at work on the field, with as many as fifty men or more at work on any single building; workers labored seven days a week. Government purchasing agents bought most of the necessary supplies locally, and when material was unavailable in San Antonio, every effort was made to obtain supplies from other sources in Texas. Lumber, for example, came from mills in East Texas, supplied under the direction of the Southern Yellow Pine Emergency Bureau, a wartime agency established to coordinate distribution of the pine lumber cut by mills throughout the South.

Stone and Webster turned the newly constructed facilities over to the Air Service officially on October 1, 1917, but by that time the field was already in use. With twenty-four large hangars and three large buildings for classrooms, Kelly Number 2 could accommodate 500 flying students, up to seventy-five instructors, and over 200 planes. Almost immediately, Kelly Number 2 became the center for flying instruction, and the hangars and shops at Kelly Number 1 became almost entirely repair and maintenance facilities. In addition, Kelly Number 1 remained the home of the reception and training center, creating a dichotomy of functions on Kelly Field that would profoundly shape future activity at the field.

Captain Seth Cook was commander of the new field when the first flying cadets arrived.

The Recruit Brigades

By the fall of 1917, the Provisional Aviation School Squadron officially was known as the Recruit Camp.

By 1917, aerial warfare was a fact of life in Europe. Recruits were given primary aviation training at Kelly Field, with further refinement of their skills given at aerodromes in France.

On October 1, 1917, it was again renamed, this time being called the 1st Training Brigade, commanded by Major A. W. Barry. From the beginning, however, it served as the first military home for the thousands of recruits coming into the Air Service. During the first two months of operations at Kelly Field, most training involved fatigue work. The new recruits were forced to help build their own quarters and assist hired laborers in clearing and leveling the flying field. From early June, with the arrival of Colonel Tayman, some order began to emerge from the chaos of hurried expansion. Under Captain John P. Edgerly, a former Navy officer, men of what would be later called the 84th Aero Squadron began testing and classifying recruits by skill, assigning them to various aero squadrons on the basis of this testing. Once a new aero squadron reached a total of 154 men, it was ready for transfer to a new location for final training, with the first of these squadrons leaving in August. By October of 1917, with the operations of the Training Brigade now going more smoothly, Kelly Field had formed and transferred eighty squadrons to other locations, with another fifty squadrons leaving Kelly in November alone.

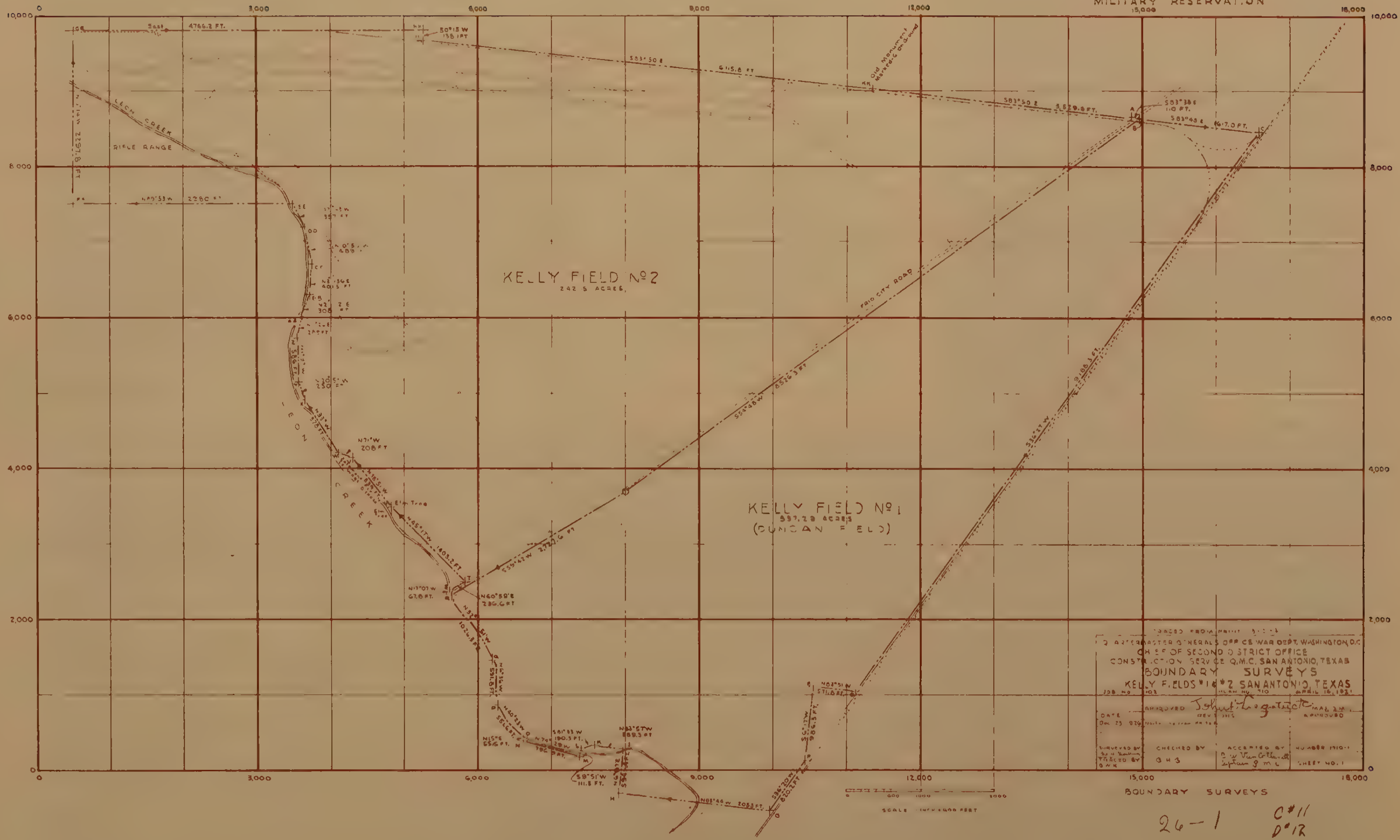
This flood of men was beyond the capacity of the 1st Training Brigade, and in December a 2nd Training Brigade was formed, followed eventually by a 3rd Training Brigade in May 1918. On Christmas Day 1917, despite the number of squadrons leaving for other locations, just under 39,000 men were crammed onto the field. By this time Kelly served as the clearing house for all the other aviation training fields, with six squadrons leaving each day, most to form the initial cadre at other training fields. Over 15,000 enlisted men shipped out in January, but another 45,774 recruits arrived to replace them. Only the arrival of 750 newly minted officers from the Army training center at Leon Springs averted a potential crisis in providing supervision for this number of men.

Camp Life at Kelly Field

The confusion at Kelly Field during the first harried months of Air Service expansion was similar to that at camps all across the country. Nevertheless, for the thousands of young men who arrived during those early days, the experience was a shock. "Do you remember," rhetorically asked one of the writers of a Kelly Field wartime yearbook, "arriving at Kelly Field after withstanding a long, hard trip, when food had given out 36 hours early, with great anticipation of becoming a great aviator and of making fame by bombing old Hun "Bill's" palace--finding yourself lined up in front of a row of tents, your feet in black mud and the wind blowing a gale, trying to obey the orders--'prepare for inspection'?" For much of the first few months, the entire field was covered constantly in blowing dust. For some time food was cooked in the open, and the unfloored tents had no stoves. Cold water baths were all that existed for most men, and many of those were entirely open.

WAR DEPARTMENT
U.S. ARMY
QUARTERMASTER CORPS

KELLY AVIATION FIELDS No 1 AND No 2
MILITARY RESERVATION


KELLY FIELD No 2
242.5 ACRES.
KELLY FIELD No 1
537.28 ACRES
(DUNCAN FIELD)
LEON CREEK
LEON CREEK
RIFLE RANGE
FRIO CITY ROAD
Old Monument Marked on Ground
S83°50 E
6115.8 FT.
S83°50 E
3,620.8 FT.
S83°38 E
110 FT.
S83°43 E
1617.0 FT.
S 89°15 W
138 FT.
East
4766.2 FT.
N 21°14 W
2297.8 FT.
N 49°53 W
2280 FT.
N71°W
208 FT
N60°58 E
280.6 FT.
N17°07 W
62.8 FT.
S55°41 W
2727.6 FT.
S55°48 W
6526.3 FT.
N33°57 W
9183.3 FT.
N03°51 W
571.8 FT.
N03°46 W
2085 FT.
N83°57 W
589.3 FT.
S8°51 W
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Elm Tree
0
3,000
6,000
9,000
12,000
15,000
18,000
2,000
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6,000
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SCALE 1 INCH = 1000 FEET

TRACED FROM PRINT 5-12-31
QUARTERMASTER GENERAL'S OFFICE WAR DEPT. WASHINGTON, D.C.
CHIEF OF SECOND DISTRICT OFFICE
CONSTRUCTION SERVICE Q.M.C. SAN ANTONIO, TEXAS
BOUNDARY SURVEYS
KELLY FIELDS #1 & #2 SAN ANTONIO, TEXAS
JOB NO. 103 PLAN NO. 710 APRIL 16, 1931

APPROVED John L. Logatreet MAJ. Q.M.
DATE Dec 23 1926
REVISIONS APPROVED
SURVEYED BY
TRACED BY G.W.K.
CHECKED BY G.H.S.
ACCEPTED BY C. W. Van Collhardt Captain Q.M.C.
NUMBER 1710-1
SHEET NO. 1

BOUNDARY SURVEYS

26-1

C#11
D#12

Dec 23, 1926

The Kelly Field Orchestra

In 1917, San Antonio was still a small town, filled with ever present reminders of its recent frontier past. Prospective pilot S. E. Elliott recalled it as a "roaring, wild west town" filled with soldiers with money to spend and plenty of local citizens willing to help them spend it. "San Antonio," he wrote, "seemed to abound in saloons that were decorated with extremely long cow horns on the walls, and with glass enclosed, realistically preserved habitants of the state, including coiled rattlesnakes and hairy tarantulas, to greet the visitor's startled eye from many nooks and corners." Encouraged by local patrons, the youthful soldiers discovered that after more than a few toasts to the heroes of Texas, to "the beautiful women of Texas and, in consideration of us foreigners, one to President Wilson, even the faces of the tarantulas seemed a bit genial." Lieutenant John Loeblein, who served as a maintenance officer at Kelly, remembered the excitement of the weekly dances held at the Officers' Club on Kelly Number 2. "Many of the squadrons on the field had their own orchestras," he recalled. "And, believe me, they were good." The officers' dance was always on Friday night, allowing the enlisted men to hold their dance on Saturday evening. Only one squadron at a time could hold a dance, and that squadron provided the musicians. "It was also understood," said Loeblein, "that officers would not hang around at the enlisted men's dances and vice versa." The dances were the supreme social event of the week, and dozens of local girls attended, each accompanied by chaperones. While soldiers going into town could experience a rowdier time, social activities on the field were tightly monitored. Still, Loeblein remembered that the "moonlight dances were just out of this world."

Aside from visiting the saloons of San Antonio or participating in a weekly dance, soldiers at Kelly could, time permitting, make use of other recreational facilities. The Young Men's Christian Association ran a reading room, for example, and sponsored a number of theatrical productions. Out of this effort emerged a traveling troupe called the Kelly Field Players, which toured northern Texas and southern

Oklahoma for several weeks with a musical show entitled "The Follies Militaire." The troupe included singers, acrobats, comics, mimics, musicians, and actors. Female parts were played by young ladies from Mrs. Matlack's Finishing School (chaperoned by Mrs. Matlack, of course). Kelly also had a glee club, hobby clubs, and numerous athletic teams.

The Trade Test Board

For all the importance attached to providing social outlets for the men, Kelly's main task was to develop skilled aviation personnel. The hectic pace of the early months resulted in constant changes in the organization of the training brigade. By January 1918, however, the system for receiving, classifying, and organizing aviation recruits was operating more smoothly. The tents of the 1st Training Brigade filled most of the area from Kelly Number 1's hangar line along the railroad tracks to the east. The 2nd Training Brigade, created in December 1917 under Colonel E. F. Goodrich, occupied much of the northern portion of Kelly Number 1 along the Frio City Road. As new recruits arrived, they joined the 1st Training Brigade. Temporarily assigned to a tent, issued uniforms and equipment, and initiated into the Army's record keeping system, the new recruits were tested as quickly as possible by the Trade Test Board, created in the fall of 1917, classified according to skills and trades and reassigned to a specific tent line housing other men with the same trades classification. All "mechanics" or "welders," for example, lived in the same area.

The Air Service filled various squadrons by taking men from the appropriate "trades area" in whatever numbers needed. Once a squadron had its proper number of men, it moved as a unit to a barracks, if lucky, or a tent row in the 2nd Training Brigade area. There its men received intensive training as the squadron prepared for deployment overseas or to another field in the United States. Eventually, the 1st

Training of aviation cadets was underway by the fall of 1917.

Training Brigade would be known as the Concentration Brigade, since in it were concentrated all the new recruits as well as the specialized squadrons which handled the testing and classification processes. By January 1919, the Trade Test Board had tested and classified by trade over 90,000 men.

The Air Service Mechanics School

The 2nd Training Brigade also operated a number of specialized schools to train both officers and men in particular specialties. The best known of these was the Air Service Mechanics School, which at its peak turned out almost 2,000 aircraft mechanics a month. The first effort to train aircraft mechanics got underway in October 1917, when a handful of prospective mechanics began classes in twelve tent hangars. On the evening of the first day of classes, though, a wind storm blew the hangars down, temporarily closing the school until more permanent facilities were available. A week later, instruction got underway once again, but this time a problem existed with the irregular attendance of many student-mechanics. Largely due to other assigned duties, including guard duty, fatigue details, and kitchen police duty, some students managed to attend only once a week. In addition, the classroom hangars were unheated, and an

Trainees in front of the headquarters of the Air Service Mechanics School.

George Edward Stratemeyer

A 1915 graduate of the United States Military Academy at West Point, Stratemeyer served in the infantry until 1916 when he was detailed to the Aviation Section for flying training. After winning his wings, he served with the 1st Aero Squadron at Columbus, New Mexico. In May 1917, Stratemeyer organized and commanded the School of Military Aeronautics at Ohio State University. He came to Kelly Field in January 1918 as Chief Test Pilot and Commander of the Enlisted Mechanics Training School. He was still the commander when the school moved to Chanute Field, Illinois, in 1920.

After serving in a variety of positions during the interwar period, Stratemeyer became General Henry "Hap" Arnold's aide in 1941, and was promoted to brigadier general. In 1943, he went to the China-Burma-India Theater as a major general. While there he was promoted to lieutenant general and became Commanding General of the Army Air Forces in China

In April 1949, Stratemeyer became Commander of Far East Asia Air Forces, which he led through the first year of the Korean War. On May 20, 1951, he suffered a serious heart attack. He retired from active duty on January 31, 1952.

Propeller manufacturing was only one specialty taught to prospective mechanics.

unusually cold fall forced the instructors to take numerous breaks for physical exercise in an effort to warm the shivering students. At one point, the instructors improvised stoves by using blowtorches aimed down into boxes of sand so the students could warm their hands. Despite these handicaps, by early December, the school managed to produce over 1,000 mechanics in a series of month-long sessions.

However, in mid-December, twenty-two of the twenty-eight squadrons supplying students at the school left Kelly Field, effectively closing the school down. In response to increased demand for mechanics, the commander of the school, Captain D. J. Neumuller, had already cut the course from a month to two weeks. He now urged Air Service headquarters to assign students to the course, relieving them of the other duties that interfered with instruction, and also argued that competent mechanics could not be trained in less than a full month.

In response to Neumuller's complaints, Air Service authorities ordered a complete reorganization and ordered Major George E. Stratemeyer to take command of the program. Stratemeyer arrived from Columbus, Ohio, in January 1918. He obtained seven of Koerner's steel-and-concrete hangars for classrooms, added more officers to the staff of instructors, and insisted upon screening all prospective students prior to including them in the course of instruction. He also subdivided the course to achieve greater specialization and altered the balance of theoretical instruction and field practice from about fifty percent of each to a ratio of twenty percent classroom theory and eighty percent hands-on training. To head the Airplane Department, Stratemeyer yanked a young trainee named Edward C. J. McShane out of the Ground Officers' Training School and had him directly commissioned as a first lieutenant. Other cadets were brought in as subordinates to head other divisions. Leo G. Shippy became head of the trades division and Ernest Richardson took charge of engines. Like McShane, both of these men were given direct commissions.

Initially, courses in the reorganized school ran for two-week periods, and were extended to three weeks in February. In March, the curriculum was again revised. To provide a means of actually assigning students to the school, the Air Service authorized the formation of a Provisional Training Battalion, with the instructors assigned to the 325th and 326th Aero Squadrons, later shifted into the 860th and 870th Aero Squadrons. Stratemeyer was also able to persuade his superiors to extend the course so that by the summer of 1918 the course was three months long. By this time the school could handle some 2,200 students in an increasing number of specialties. In September, Stratemeyer introduced the idea of taking the student-mechanics up on orientation flights. Although this was done primarily to give them an understanding of what went on in the air, it also served as a subtle reminder of how crucial their work was. As the "Kelly Field Eagle," the field newspaper, reported: "There's nothing like a 2,000 foot ride for turning a lax student into the most careful of workers." By the Armistice almost 3,200 men had completed the revised course, and the school was widely hailed as one of the premier mechanics training programs in the world. Almost completely closed down in the general demobilization that followed, the school continued to produce a handful of mechanics for the next two years. In 1920, the Air Service moved it from Kelly Number 1 to Chanute Field, Illinois.

Other Specialized Schools

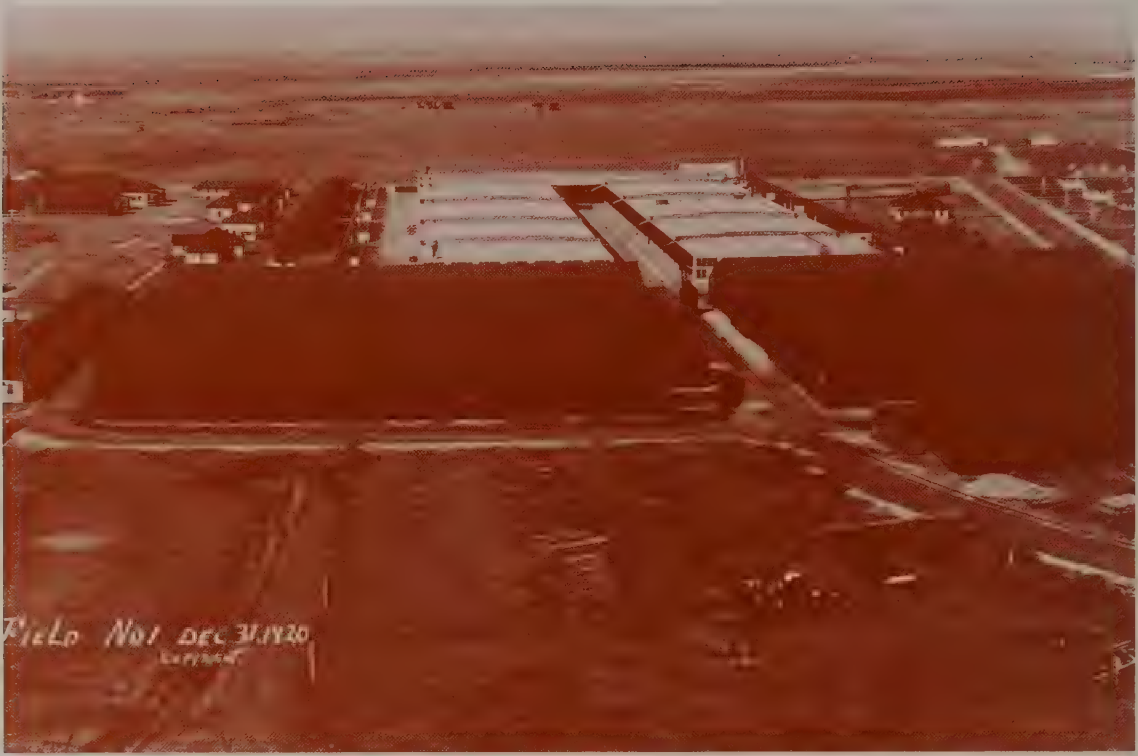
Another school, operated by the 2nd Training Brigade, was the School for Bakers and Cooks. In the fall of 1917, two officers, one captain and one first lieutenant, and twelve sergeants arrived from Fort Sam Houston and Camp Travis to begin a course in mess management for seventeen junior officers. Within a few weeks all mess sergeants and cooks at the field also had to take the course, taught in tents and mess facilities throughout Kelly. By the end of World War I over 100 mess officers, 165 mess sergeants, and 2,200 cooks graduated from the course, most of whom served as mess supervisors and cooks at Kelly.

Another of the specialized schools operated at Kelly was the Ground Officers' Training School. Organized in September 1917, this school was intended to produce supply and engineering officers and adjutants. In many ways, this school was the forerunner of the Air Force Officers' Training School. Students in the school were, like their counterparts in the flying department, termed cadets and received commissions upon graduation.

The Kelly Field Ground Officers' Training School began operations on Kelly Number 2, but moved to Kelly Number 1 in December 1917. The initial curriculum included some 272 hours of instruction over eight weeks, including sixty hours of infantry drill; but the desperate need for officers forced officials to shorten the course to seven, then six, weeks by the end of the year.

Then, in January 1918, the Air Service decided that the specialized training of ground officers could be better handled by a series of different schools around the country. Accordingly, ground schools appeared at the Massachusetts Institute of Technology (engineering officers), Ohio State University (adjutants), and the Georgia Institute of Technology (supply officers). The last class to enter the Kelly Field Ground Officers' Training School arrived on January 5, 1918. A week later its members were scattered to the newly created specialty schools, and the Kelly Field school was closed.

The School for Cooks and Bakers produced over 2,000 cooks.



The San Antonio Aviation Supply Depot warehouses in 1920.

The San Antonio Aviation Supply Depot

As Kelly Number 1 became crowded with the tents, barracks, and mess halls associated with the training brigades and their associated schools, flying was increasingly shifted north to the adjoining Kelly Number 2. More and more, Kelly Number 1 was home to support activities, including supply and maintenance. In 1917, the San Antonio Aviation Supply Depot, established at Fort Sam Houston in 1914, was supervised by Lieutenant Julius C. Tips and located in a warehouse on South Flores Street in San Antonio. Its administrative offices were on the second floor of the Tips Hardware store on Commerce Street.

The rapid increase in flying operations during the spring of 1917 forced the depot to expand. In September, Lieutenant Tips secured a warehouse on Kelly Number 1. In January 1918, the small staff of the depot was augmented by the assignment of the 675th Aero Squadron as an aero supply squadron. A few weeks later, the 662nd Aero Supply Squadron also joined the depot, bringing its enlisted strength to some 300 men. In late April, Captain Samuel Anable arrived to supersede Lieutenant Tips, and in August 1918, Captain Anable was superseded by Colonel William F. Pearson, who continued in command of the depot for the remainder of the war.

In an effort to consolidate supply activities at regional centers, Air Service officials decided to form an aviation general supply depot at San Antonio and construction began on a large warehouse at Kelly Number 1 in October 1917. In June 1918, the depot completed its move from downtown San Antonio to the new warehouse.

The depot on Kelly Number 1 was an immense concrete-and-steel structure built by the same Stone and Webster contracting firm responsible for building Kelly Number 2. Almost 900 feet long and 300 feet wide, the depot building was divided by a pair of tracks leading directly from the main rail lines south of the field and was internally subdivided into eleven separate warehouses. Between 200 and 300 railcars arrived with new material and left with issue items each month. Post-war demobilization slowed the pace of depot operations considerably, of course, but it remained open, partly because so many flying units were concentrated at the field from 1920 to 1921.

In 1921, the Air Service decided to consolidate repair and supply depots for greater economy, and brought the Air Service Aviation Repair Depot from Dallas to join the existing supply depot on Kelly. The resulting organization was known as the San Antonio Air Intermediate Depot, a direct organizational ancestor of today's air logistics center.

Flying Training

Kelly Field was more than just a reception center for recruits and a supply center; from the beginning it was also one of the most important basic flying schools in the United States. Although instructors began teaching the rudiments of flying to prospective pilots as early as August 1917, the Flying Department was not officially organized until mid-September. Located on Kelly Number 2, the Flying Department assumed responsibility for all aspects of flying training.

The Course of Instruction

Pilot instruction was a rudimentary science in 1917, especially in the United States. Immediately following American entry into the war, a board of officers hurriedly traveled north to investigate Canadian training methods and facilities. Although Allied aviators were on their way to the United States

Future pilots get their first close look at a "Jenny."

The JN-4 "Jenny" was the most widely used trainer during World War I. It would serve until the mid-1920s.

Arrival of the First Cadets

On August 1, 1917, a group of eleven young men assembled at Kelly Field prior to attending the School of Military Aeronautics at the University of Texas, Austin. These young men were all prospective flying cadets, and would become the fourth of eighty-one classes to attend the Austin ground school before returning to Kelly to earn their wings. The first three classes bypassed Kelly, going overseas for their flight training.

As the group stood at the edge of the field, Major Seth Cook approached, offering to take them up one at a time for familiarization flights in his JN-4 "Jenny." All of them eagerly accepted, and the first chosen to fly with Major Cook that day (thus becoming the first cadet to go aloft from Kelly Field) was John Ireland.

Flying was risky in the early days. Four of Ireland's classmates were killed in training. The first was Cadet Sidney J. Brooks, a San Antonio native who became Kelly Field's first training fatality. Only one of the eleven made it overseas: Hugh Brewster shot down two German planes while flying a SPAD VIII with the 49th Pursuit Squadron in September 1918.

Thirty-five years after John Ireland took that first exhilarating ride with Seth Cook, he was an engineering aide with Kelly's Aircraft Repair Division. From his office window he could see the spot he first flew, less than a hundred yards away in front of building 324.

to offer advice on how to structure a pilot training program, the Army decided not to wait for their arrival and simply adopted the Canadian system. (Among other things, the board also recommended adoption of the hangar design used at Camp Borden, Ontario, as the "standard" design for American hangars. This design featured laminated wood beams held together with bolts, wooden siding, and large sliding doors. The hangars on Kelly Number 2, as well as hangars all across the country, were built this way, making Koerner's steel-and-concrete hangars on Kelly Number 1 unique.)

The Canadian system began by putting all prospective pilots, deliberately called aviation cadets, into the classroom for eight weeks of theoretical study. With the help of Yale University Professor Hiram Bingham, the Army promptly created six ground schools in May 1917 at Cornell University in New York, the University of Illinois, the University of California, Ohio State University, the Massachusetts Institute of Technology, and the University of Texas in Austin. Two additional schools appeared later at Princeton University in New Jersey and the Georgia School of Technology (Georgia Tech). Instruction at these schools during the first few months was erratic, with many instructors only partially prepared. Few had any background with aviation. But, the Army soon standardized the curriculum, with courses in engines (thirty-five hours of

Cadet Sidney J. Brooks

HEADQUARTERS
CADET WING.

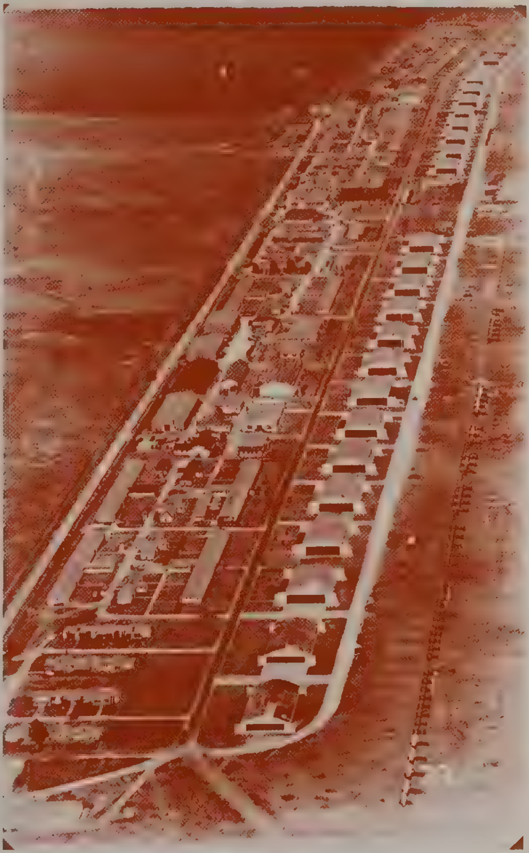
Student flyers were identified by white bands on their caps.

instruction), observation (thirty-one hours), meteorology (two hours), signaling (twenty hours), gunnery and bombing (twenty-four hours), and airplane construction and theories of flight (twenty-one hours). Naturally, they also had regular drill instruction.

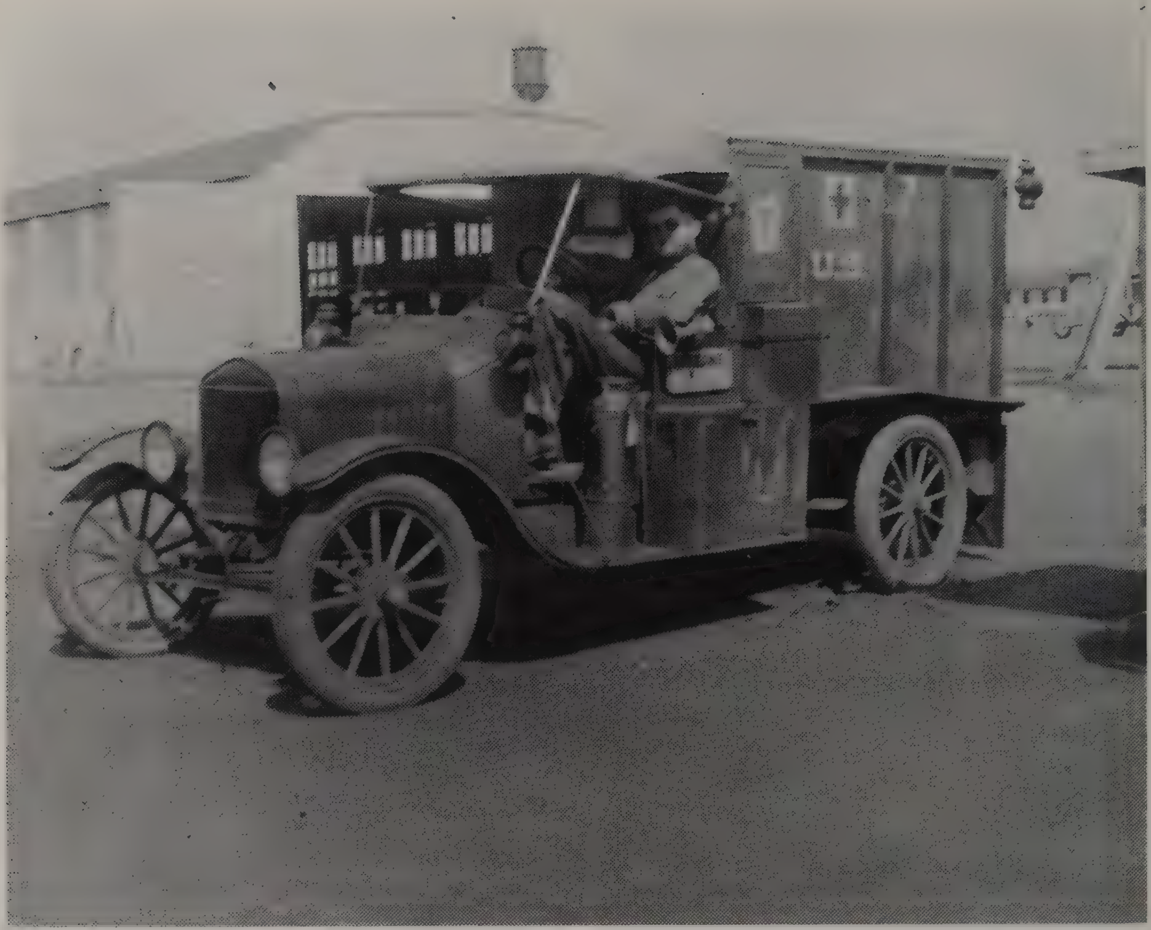
By regulation all the young men accepted for aviation training had to be under twenty-five, have two or three years of college or technical training, and be athletic, honest, and reliable. Many were naturally impatient with the ground school portion of their training, and were eager to get into airplanes as quickly as they could. Future General Howard Craig (who retired as Commandant of the National War College in 1955) enlisted in the Air Service in 1917 and attended ground school at Princeton. He remembered struggling with the classwork. Eventually, Craig had to plead his case before an Academic Board, which permitted him to continue.

Following ground school, cadets went to flight school for a further six to eight weeks of instruction. Commissioned after successfully completing this portion of the training program, they then went on to an advanced school for a brief one-month course in a particular specialty--pursuit, bombardment, or observation. New pilots accumulated only about ninety flying hours before being considered ready for the front, and many had less. The first cadets arriving at Kelly Field from the ground school at the University of Texas reached the field on August 6, 1917. (One of the cadets in this first group was San Antonio native Edgar Tobin, who would go on to become an ace during the war and return to Kelly as an instructor in 1919.) Four JN-4 "Jennies" and twelve Curtiss Model R-4 trainers were available, but there was little time for instruction (and a shortage of instructors). Some flying instruction may have taken place, but it was minimal, even by the standards of 1917. These first cadets, along with the next three classes to arrive, were simply shipped on to get their flying training overseas.

Flight training proceeded by a series of steps known as stages, and began with the dual instruction stage. With the instructor initially handling take-offs and landings, the student was coached through increasingly difficult maneuvers. After some four to



The Kelly Number 2 Flight Line



The Kelly Field "Meat Wagon"

nine hours of this, the instructor turned the student loose to solo. This stage might include up to twenty-five further flying hours, with some additional dual instruction thrown in. The solo stage was followed by cross-country and formation flying and acrobatic instruction for another twenty-five or so hours. During each stage, the cadet also continued to attend ground classes on various subjects such as navigation and the proper conduct of officers.

In 1918, the Air Service replaced this stage system with the British-developed Gosport system, sometimes referred to as the "all thru" system in American manuals. In the Gosport system a single instructor stayed with the same group of students throughout their primary flight training, and the various stages overlapped. A key feature of this system was the use of a speaking tube by the instructor, who now sat in the rear seat of the aircraft and could correct errors verbally. In the stage system, the instructor usually sat in the front cockpit, and tried to direct the student by hand signals. It was difficult, if not impossible, for an instructor to convey much in the way of complicated instructions using this technique, at least while in the air.

While it was a distinct improvement over existing training methods, the Gosport system was not fully adopted until late in 1918, meaning that the vast majority of Kelly's aviation cadets learned their skills in the older "stage system." Whichever system was followed, flying was still a rough-and-ready business. One manual urged pilots to "look over the machine in a general way" before they climbed into the aircraft and added the admonishment to "be sure the controls are working properly."

Fatal crashes were, fortunately, fairly rare. But non-fatal accidents were frequent. Cadet Carl Foster remembered one such incident:

> After some tight eights over the cemetery and a tower for the other point on a Saturday afternoon, I came in for a landing over Hangar 1 directly into the sun in full view of the men lined up across the field for retreat. Before I could land, Lieutenant Heartfield came plunging into me from my right side and we crashed. I recall my nose was terribly itchy and as I crawled out of what was left of my plane, Ray Coward came out in a motorcycle and said, 'Get in,' to which I recall telling him I would walk in, and proceeded to fall flat on my face.

Foster did not remember anything else until awakening in the infirmary with the doctor sewing up his nose. The driver of the field ambulance, known locally as the "Meat Wagon," later told him that on the way to the hospital he'd stopped at a drug store for refreshments. Coming out, the driver said he found Foster and Lieutenant Heartfield engaged in a fistfight over which would have the first drink. Cleared by a court of inquiry, Foster was soon back in the air.

His case was not atypical. Another student pilot remembered losing control of his Jenny and crashing from about seventy-five feet. "To be sure my folks would recognize me when they shipped me home in a casket," he said, "I covered my face with both hands." Opening his eyes hesitantly, the young pilot found "my feet were still there." Getting out, he reported to the officer in charge and was promptly put into another plane, apparently a technique designed to ensure that pilots would not lose their nerve after a crash. "This time," reported the apparently unshaken flyer, "I kept my nose down and came out O.K."

After minor accidents, student pilots were encouraged to go back up right away.

The Flying Stinsons

Eddie Stinson

Among the first four flyers to land at the newly cleared field in April 1917 was a young San Antonio civilian named Eddie Stinson. His presence with the Army pilots was no accident, despite his non-military status. The Stinsons were already famous for their pioneering efforts in aviation, and Eddie himself was, for all his skill, actually less well-known than his sisters, Katherine and Marjorie.

Katherine was just twenty-one years old when she soloed in July 1912, becoming just the fourth American woman to gain a pilot's certificate from the Federation Aeronautique Internationale (FAI). The following April she and her mother formed the Stinson Aviation Company, and Katherine began touring with her own Wright-B "Flyer." In 1913, the family moved to San Antonio and somehow Katherine got permission to use Foulois' former sheds at Fort Sam Houston to store her plane. She also got permission to use the parade ground as a landing field. A year later, her nineteen year old sister Marjorie became the ninth woman to earn an FAI certificate.

The flying sisters earned money touring and teaching. In May 1915, Katherine also became the first woman to fly the mail in Texas. During this time, their mechanic was their brother, Eddie. Despite his eagerness to fly with them, neither would teach him; perhaps because he had a reputation for drinking. But during 1915, Eddie scraped up enough money to pay for lessons at the Wright School in Dayton, Ohio.

Eddie joined his sisters in San Antonio in the fall, just about the time the 1st Aero Squadron arrived from Fort Sill, Oklahoma. Evicted from Fort Sam Houston, the family leased a 750-acre tract south of the city and built their own field.

With World War I underway, the Stinsons began training Canadian pilots at their field. During 1916, Katherine toured western Canada, Japan and China while her sister handled the instruction. Eddie helped teach acrobatics to the pilots of the 1st Aero Squadron. During this period he allegedly discovered, apparently by accident, the secret of escaping from a spin.

Impressed, Benny Foulois is said to have demanded that Eddie teach the technique to all his pilots. When the field that would become Kelly opened in April, Eddie Stinson was a natural choice to lead the three Army flyers to it.

Diagnosed as tubercular by an Army doctor, Eddie could not get a commission. Near the end of 1917, while serving as a civilian instructor at Kelly, his frustration triggered a monumental bender. Eddie awoke to find himself a private in the Army. Hustled back to Kelly by irate officers, he was soon back at work as an instructor. When Army officials denied his request to go overseas, he disappeared for a week to drink away his disappointment. His instructor's skills were desperately needed, but the Army did not want to have a soldier who was periodically going AWOL (absent without leave) , nor were senior officers happy at having a private instruct officers (especially a private with Eddie's wild reputation). So, he was quietly discharged and hired as a civilian again. For all his bad habits, Eddie was a superlative flyer. His aerial demonstrations left other pilots awed. For the rest of the war he served as a civilian instructor pilot at Kelly.

Katherine Stinson stopped flying in 1918. Exhausted by her touring schedule, she contracted tuberculosis, fighting the disease for six years before recovering. She married in 1928, but did not fly as a pilot again. She died in 1977 at the age of 86. Marjorie flew as a barnstormer until 1928, and quit altogether in 1930. She died in 1975 at the age of 79. Eddie founded the Stinson Aircraft Corporation in Detroit during the 1920s and was a leading figure in the aviation enthusiasm of the 1920s. On January 25,1932 he was fatally injured when he crash-landed on a Chicago golf couse while demonstrating one of his planes to a customer. Stinson Field in San Antonio remains an active municipal airport and a fitting memorial for a remarkable flying family.

Marjorie Stinson with her instructor John Frost

Serving as an instructor under these conditions could be nervewracking. Lieutenant John Loeblein remembered instructors using the cockpit fire extinguisher to knock out panicked students who would not release the controls. In a similar vein, M. Gould Beard recalled struggling with his instructor over the stick while practicing spin recovery. Beard was worried that his instructor, Lieutenant John St. John, thought he'd "frozen" at the controls and would ground him. Apparently, this was not the case. Beard was soon flying again and soloed shortly afterward. But Lieutenant St. John "never went up with me again."

More aircraft arrived in September and October 1917, allowing training to increase as Kelly Number 2 neared completion. Named commander of Kelly Field in October, Colonel William D. Chitty promptly reorganized the Flying Training Department and the Ground Officers' Training Department. Reorganization, though, did not end all problems, one of which was the rapid rotation of officers through Kelly Field. The first commander of the newly reorganized Flying Training Department, for example, was Major W. E. Wilbourn, a former cavalryman who had served with Colonel Chitty in the 12th Cavalry. Wilbourn, however, was succeeded by Major Harvey Burwell, the youngest major in the Army, at the end of November. Major Paul Ferron, a member of the 1st Aero Squadron before the war, succeeded Burwell only two weeks later. Nevertheless, by the end of December, 261 cadets were hard at work, logging 229 hours and thirty-six minutes in the air on December 27 alone. Indeed, by the end of 1917, student pilots at Kelly had accumulated almost 6,000 flying hours.

Lieutenants Harold Clark, Frank Bell, W.W. Meyer, H. Spencer, and Sig Landers were instructors at Kelly during the immediate post-war period.

These totals continued to increase during the first months of 1918. The number of cadets taking instruction more than doubled during January, with almost 600 embryonic flyers competing with aviators in the new instructors course for air time. In February, Kelly's student pilots logged 9,500 hours, and the Flying Department scheduled over 12,000 hours of flying during March. By this time Kelly's pilots were flying more hours than the pilots at all other training fields combined. On March 18, with over a 100 aircraft in use, they logged an incredible total of 1,033 hours and 29 minutes of flight time. The sky over south San Antonio was crowded during daylight hours.

From the peak in early 1918, both the number of cadets in training and the number of flying hours began a steady decline. Instructor training shifted to newly constructed Brooks Field in September 1918, and in August the number of cadets at Kelly Field dropped below 300 for the first time since the preceding December. Still, by the Armistice 1,459 Army pilots had emerged from the Kelly Field training program, with the advanced program generating another 298 instructor pilots. Kelly Field flyers logged 153,876 flight hours during seventeen months of operation. One civilian and twenty-five military pilots died in accidents.

Kelly Field in the Post-War Years

Armistice Day, November 11, 1918, found the field still crowded with recruits and flying cadets. Cadet M. Gould Beard remembered being awakened early on the morning of November 11 by the sounds of celebration coming from San Antonio:

> "There was dead silence for about thirty seconds, and then the whole barracks sat up and started cursing at the floor, damning the Germans for having lain down on the job before they had a chance to get over there and prove their merit as aviators. There was no enthusiasm for the Armistice in those cadet barracks."

Kelly Field's Victory Loan Flight included Majors George Stratemeyer and Edgar Tobin (standing in the center of the second row), along with Captains H.H. Powell and S.E. Mitchell, and Lieutenants D.R. Phillips, E.P. Streeter, F.B. Estell, F.C. Carroll, J.L. Whitney, F.L. Smith, A.M. St. John, P.A. Smith, H.C. Roberts, L.R. Hewitt, G.H. Behler, and C.J. Morris.

Discipline briefly broke down, with cadets simply going to mess when they pleased, "some not bothering to shave." Beard and a few of his fellow cadets went into the city that afternoon. Downtown, they were happily pelted with flour by local citizens and had their faces pasted with shoe polish. After one beer, they fled back to the relative safety of the field. The next morning Beard and nine other cadets received their commissions. Training, however fitfully, got slowly underway once more.

The reaction of Beard and his fellow cadets to news of the Armistice was not typical. The end of the fighting in World War I was greeted in most places with exuberant joy and the immediate demand that the "boys be brought home." In response to this nationwide outcry, and in keeping with traditional American practice, demobilization was incredibly swift. The Army discharged over a million men before the beginning of February 1919 and another 1.7 million men before the end of June. From a total strength of 190,000 officers and men at the time of the Armistice, Air Service strength fell to under 9,600 by June 1920. Of its 1,168 officers, over 1,000 were temporary appointments with uncertain status.

Nevertheless, some recruiting still took place. Many skilled men had left during demobilization, yet their skills were still needed. At one point, the Air Service even agreed to fly prospective recruits from their home to the nearest field. In addition, the Air Service put on air shows and exhibitions--both to celebrate the end of the war and to attract recruits by drumming up enthusiasm for aviation. In early 1919, the Air Service formed a "Victory Loan Flying Circus" of three flights to put on shows all over the country. One of these was formed at Kelly, although it was officially based at Ellington Field outside Houston, under Major George Stratemeyer. The local flight included San Antonio native Edgar Tobin and toured some fourteen states in addition to Texas. On April 12, the team put on a show at Kelly which featured a "German" attack on a "French" village, complete with simulated artillery barrage and aerial bombing. "German" troops then entered the village, looting and abusing the citizens before "American" planes appeared to drive off the enemy. As the planes drove the "German" aircraft away, American soldiers advanced to recapture the village. It was, promised the ad, "a wonderful show" and was fairly typical of the exhibitions put on all over the country by the "Victory Loan" flights during a month-long national tour in April.

Flying Unit Consolidation at Kelly

Demobilization meant the elimination of most wartime flying squadrons. The 27th, 94th, 95th, and 147th Pursuit Squadrons of the 1st Pursuit Group, the 11th, 20th, 96th, and 166th Bombardment Squadrons of the 1st Day Bombardment Group; several observation squadrons; and a handful of balloon companies were all that remained active. In mid-1919, the pursuit squadrons, the bombardment squadrons, and four observation squadrons (8th, 12th, 90th, and 104th) became a wing of three groups at Kelly Field. The 1st Pursuit Group retained its name, as did the 1st Bombardment Group. The observation squadrons were combined into the 1st Surveillance Group. Aside from a few other observation squadrons, most stationed at Fort Sill, these were the only active flying units in the Air Service. Collectively, they became the 1st Wing. In 1921, the 1st Surveillance Group became the 3rd Attack Group.

Border Patrol

Even while the United States fought in Europe during World War I, fighting continued to occur along the border with Mexico. Bandits often raided American ranches for supplies, cattle, and horses, and American cavalry units pursued them into Mexico. In one such clash, over 800 American troopers fought over 600 Mexicans near Nogales, Arizona, in August 1918.

In June 1919, a large force under a still-active Pancho Villa, moved toward Juarez, which was garrisoned by Mexican government troops. In response, Major General DeRosey Cabell, Southern Department Commander, brought in aircraft from both Kelly and Ellington Fields to form a border patrol. When Villa attacked Juarez in mid-June, stray fire hit several American soldiers and civilians on U.S. soil, killing one soldier and one civilian and wounding two soldiers and four civilians. American troops promptly crossed into Mexico to disperse Villa's force. American aircraft, under the command of Major Edgar Tobin, began arriving at Fort Bliss the morning of June 15 and began regular patrols on June 19.

The Army planned to station at least nine squadrons along the border. Two of these, the 9th and 91st Observation Squadrons, were based at Rockwell Field, California (the former North Island Field), while three observation squadrons and the four bombardment squadrons from Kelly Field would operate from small fields along the border from Brownsville to the Arizona border. The aircraft of the 1st Pursuit Group were also soon available, meaning that almost the entire 1st Wing, under Colonel Henry C. Clagett, was committed to the border patrol by the summer of 1919.

Pigeons at Kelly Field?
Yes, Sir!

During the early days of World War I, a primary means of frontline communications was not by radio, or the familiar dot-dash (Morse) code system, but by messenger pigeon. As one of the premier flying centers in the United States, naturally Kelly Field had its own pigeon department. Its mission in 1917-1918 involved breeding, raising, and training these pigeons for future use in combat. And, with both sides shooting at anything that flew, messenger duty often proved hazardous for these "flyers."

In most cases, the civilian trainers were professional pigeon handlers. They trained the birds in three phases. The first familiarized the pigeons with their "cote" or home. During the second phase, trainers released the birds in an area closest to the cote. This area was slowly expanded as the bird learned to find its way home. Finally, the trainers took the birds several miles away and released them. Each bird was rated on the basis of distance traveled and time required to make the journey. It was a form of graduation exercise, and as a reward these "flyers" got what many of their human counterparts desired--frontline service in France.

The 11th Aero Squadron flew as part of the Aerial Border Patrol

However, by the time the aerial patrol was in place, the threat posed by Pancho Villa was largely gone. Beginning in January 1920, Kelly's Surveillance Group, reinforced by a fourth squadron (the 12th) handled the patrolling chores from a series of small fields along the border. The bombardment and pursuit squadrons remained at Kelly.

Although the aerial patrol did sometimes spot potential raiders, most of the time the young flyers simply cruised over an empty and forbidding landscape. Sometimes pilots got lost and strayed over Mexico. Most of these incidents, despite Mexican protests, were accidental. But occasionally things got rather exciting. In August 1920, for example, Lieutenants Harold G. Peterson (pilot) and Paul H. Davis (observer-gunner) were forced down by engine trouble after mistakenly following the Conchos River into Mexico. Bandits captured them as they tried to hike back to the border, and their captor demanded a $15,000 ransom. Captain Leonard Matlack, a cavalryman stationed at Candaleria, Texas, offered to carry the ransom across. In exchange for half the money, Matlack first brought back Lieutenant Peterson. While returning with the rest of the money for Lieutenant Davis, Matlack overheard the bandits plan to kill both of them. At the exchange, Matlack pulled his gun, faced down the bandits, and rode away with both Davis and the remaining cash.

By the fall of 1920, active patrolling had nearly ceased in favor of experiments in air-ground cooperation, radio communication, aerial gunnery, and formation flying. When Kelly's observation group became the 3rd Attack Group in 1921, the 1st Pursuit Group moved to Ellington Field. During the same period, many of the pilots and men of the 1st Bombardment Group left Kelly to participate in Brigadier General Billy Mitchell's bombing tests. The remainder of the bombardment group, by then called the 2nd Bombardment Group, would leave Kelly for Virginia in early 1922.

Post-War Training at Kelly Field

By the end of February 1919, all the Air Service ground schools were closed, as were most primary training fields. Ground school and primary training were concentrated at Carlstrom Field, Florida, and

March Field, California. In July 1919, Congress limited the total of flying cadets on duty to 1,300 at any one time, an authorization briefly raised to 2,500 by the National Defense Act of 1920 before falling to 500 after budget cuts in early 1921. War Department allocations limited the number of cadet slots even more.

Primary and basic training was initially a four-month course (later it became a six-month course) and was followed by more advanced training with an active unit. Observation students went to the Observation School at Fort Sill until 1922, but in the absence of specialized schools for pursuit or bombardment training those skills were taught by the groups at Kelly. When the 3rd Attack Group came into existence in 1921, it began offering advanced training in that specialty as well.

However, the Air Service began reorganizing this training program even as it was established. In 1921, March Field closed. In 1922, so did the primary school at Carlstrom Field. Replacing them as the site for basic and primary training was a new school at Brooks Field.

Then, in July 1922, the Air Service consolidated all advanced training in a new Air Service Advanced Flying School at Kelly Field. These changes not only made San Antonio the flying training center of the Air Service, they once again brought Kelly to the forefront of American military aviation. For the next two decades, young men who wanted to fly for the Army would find themselves at Kelly.

The DH-4 was a familiar sight in the south Texas sky.

CHAPTER TWO

ALMA MATER OF THE AIR CORPS

The Armistice of 1918 ended the immediate need for large numbers of pilots. Some training continued. The need for Air Service pilots did not disappear completely, but the vast majority of training centers were closed, with the pace and intensity of training slowing dramatically. During 1919, the Air Service concentrated both ground school and primary flight training at March Field, California, and Carlstrom Field, Florida. Congress authorized limited enlistment of flying cadets.

If a cadet survived the course at Carlstrom or March Fields, he went on to advanced training. Observation students went to the Observation School at Fort Sill, Oklahoma, but no schools existed for pursuit or bombardment training. Advanced flying students in those specialties received their training with either the 1st Pursuit or 1st Bombardment Groups, both at Kelly Field until 1921. The flying groups provided instructors for both ground classroom and aerial training in tactics, aerial gunnery, and battle maneuvers. At the same time, service with active units gave them experience with supply, engineering, operations, and Army paperwork. Pursuit students progressed from the "Jennies" to DH-4 two-seaters and then to SE-5 fighters leftover from the war. Bombardment students transitioned to DH-4s, too, with a handful moving on to Curtiss and Martin NBS-2 series aircraft when those became available. Creation of the 3rd Attack Group at Kelly Field in 1921 opened up a fourth specialty. Students in it also flew the DH-4, the all-purpose Air Service craft of the early 1920s.

Between mid-1921 and mid-1922, this training program was completely restructured in conjunction with a total reorganization of the Air Service. The primary flying school at March Field closed in 1921, and the school at Carlstrom Field closed in early 1922. Concurrently, the Air Service opened a new primary school (now the only one) at Brooks Field and concentrated all advanced training in a new Air Service Advanced Flying School at Kelly Field which opened on June 28, 1922. For the next two decades, San Antonio would be the Army's flying training center, and every young man who succeeded in becoming an Army aviator would finish his schooling at Kelly Field.

ENLIST IN THE
AIR SERVICE

AIR SERVICE
ADVANCED
FLYING SCHOOL.

The Advanced Flying School was organized in 1922.

The Air Service Advanced Flying School

Primary training at Brooks Field began with the traditional classroom instruction before progressing to flying training in the still-present JN series two-seaters. The flying cadet who survived this six-month long course became a Junior Airplane Pilot and then moved a few miles west to Kelly for another six-months (initially eight months) of specialized training before he could win his commission and wings.

The Advanced Flying School was run by the 10th School Group, made up of the 39th (Observation), 40th (Attack), 41st (Observation), 42nd (Bombardment), and 43rd (Pursuit) School Squadrons; the 13th Air Park; the 22nd Photo Section; and the 10th Group Detachment (headquarters). Although the 10th School Group certainly coordinated its training activities with those of the primary school at Brooks, no higher headquarters existed to supervise all training until 1926.

From 1922 to 1927, training at the Advanced Flying School, located on Kelly Number 2, followed a course of instruction known as the "A" plan. Under this plan, survivors of the primary course at Brooks Field completed about seventy-five hours of instruction. At Kelly the advanced flying cadet received transition training to the DH-4. Once he'd soloed, the cadet flew on his own except for occasional check flights, for approximately twelve weeks, following a basic program similar to the "stage system" used during World War I. James Burwell, who passed through the Advanced Flying School in 1927, recalled a decade later:

> When he graduated, a student had a total of approximately 200 hours' flying time, but knew nothing of instrument flying, radio beam work, or many of the other phases taught today. Even so, he was regarded as being one of the best trained pilots in the world, and it was not unusual, near graduation time, to see representatives of commercial lines on the field offering students who were about to graduate contracts calling for three to four times the rate of pay they were to receive in the Army.

A cadet's first solo was a vital step on the road to a commission and wings.

The training was, indeed, both thorough and rigorous. Rarely, though, was there a shortage of applicants. And, with the number of available cadet slots limited by budget constraints to less than 200 during many years, the Air Service could take the "cream of the crop." For example, of 1,288 young men who sought to become pilots in 1925, only 362 passed the cadet examination, and the Air Service took only the top 108. Attrition further reduced cadet ranks. Of the 202 cadets entering training at March and Carlstrom in January 1920, sixty-one graduated at the end of six months. Another forty-three were still in training, but ninety-eight were "washed out." Throughout the 1920s, cadets dreaded the deliberations of the so-called "Benzine Board," the group of officers which determined which cadets would remain in training.

Civilians enlisting as flying cadets had to be unmarried, American citizens, between the ages of twenty and twenty-seven, with a high school education, good character, excellent health, and sound physique. Non-rated Army officers could also apply for flight training, as could Regular Army enlisted men who met the rest of the requirements. Eventually reserve officers, Naval personnel, and officers from several foreign countries would also be accepted. Later, the educational requirement was raised to include two or three years of college, preferably in an engineering field.

"Lucky Lindy" at Kelly

Among the cadets who took advanced flying training at Kelly under the "A" plan was a young Minnesotan named Charles Lindbergh. Having already learned to fly, Lindbergh still found the adjustment

Charles Lindbergh graduated from the Advanced Flying School in 1925.

to the Air Service difficult. While still in primary school at Brooks Field, he regularly slipped over to nearby Stinson Field to teach a friend to fly an old Jenny they owned jointly. By dint of hard work, Lindbergh was among the thirty-three cadets, from an initial 104, who got to the advanced school in September 1924.

At Kelly, Lindbergh specialized in pursuit. On March 6, 1925, nine days before graduation and commissioning, Lindbergh was part of a nine plane flight practicing gunnery near Galveston. Flight leader Eugene Stevens, who retired from the Air Force as a colonel, recalled: "We were flying S.E.-5 single seaters, when Lindbergh and McAllister accidentally pulled together while zooming upward toward Lieutenant Maughan's D.H.-4." Lindbergh reported that he felt only a "slight jolt followed by a crash." The formation immediately broke up as "pieces of wood from spars, ribs or struts floated away from the crash in what appeared to be slow motion."

Incredibly enough, both Lindbergh and Lieutenant McAllister were unhurt, and both jumped safely moments later. Lindbergh lost the ripcord to his parachute, which got him a good deal of teasing from his fellow cadets, but was otherwise unscathed.

Relieved at the sight of the two chutes, the other members of the flight promptly made a series of diving passes at the wrecked and burning planes, then straggled back to Kelly. The haphazard arrangement upon their return was a sign to the officers on the ground that something was wrong, but Stevens recalled that "it was quickly explained, and that was the end of a perfect day." New planes were soon available for Lindbergh and McAllister, who became the 12th and 13th members of the "Caterpillar Club"--men who successfully "took to the silk" as a result of trouble in the air. Ironically and fortunately, and an example of the circumstances that contributed to Lindbergh's legend, his class was the first to be issued parachutes.

The Air Corps and the Five Year Plan

In July 1926, President Calvin Coolidge signed the Air Corps Act, an outgrowth of War Department efforts to reorganize and strengthen Army aviation. The act officially changed the name of the Air Service to the Air Corps, created an Assistant Secretary of War for Aviation, ordered the Army General Staff to create an Air Section, and authorized an expansion of the Army's air arm over a five-year period. Most of these changes had been outlined by War Department boards investigating aviation needs--the Lassiter Board of 1923 and the Morrow Board of 1925. The Lassiter Board urged a ten-year program of expansion, but its implementation foundered on the issue of the division of aviation money between the Army and Navy. The proposal of the Morrow Board was for a somewhat less ambitious expansion over a five-year period, and this, over the objections of General Mason Patrick, Chief of the Air Service, became the basis of the Air Corps Act passed by Congress.

Although the primary impetus toward reorganization was a desire to increase the number of tactical squadrons, the Air Corps Act had more immediate impact on the administrative aspects of Army aviation. The new law authorized (but did not fund) an expansion from 919 officers and 8,725 enlisted men to 1,650 officers and 15,000 enlisted men by 1932. To meet its officer goal, the Air Corps required an additional 1,485 commissioned pilots. Given that a large percentage would "wash out," suffer fatal crashes, or simply give up during training, planners estimated that this would necessitate bringing in some 500 flying cadets per year. Brooks Field was too small to handle that many student flyers, so in 1926 the Air Corps reopened the primary flying school at March Field. In addition, the schools at both Brooks Field and Kelly Field were joined under the umbrella of the Air Corps Training Center, headquartered at Duncan Field (Kelly Field Number 1) and commanded by Brigadier General Frank Lahm.

A few months later, General James Fechet, Assistant Chief of the Air Corps, suggested that the new training organization should also include the school at March Field and outlined a restructuring of the course schedule so that primary and basic flight training would take place at either Brooks or March Fields for eight months, followed by four months of advanced training at Kelly. Approval of Fechet's proposal meant an end to the "A" Plan training system and ultimately contributed to the construction of Randolph Field as a primary training site.

By The Numbers

At a time when the only thing keeping a pilots' body from almost certain death was constructed of linen-covered spruce, mahogany, or fir, it is easy to see the importance of establishing practices and procedures to ensure the proper handling of aircraft. The following operational checklist is comprised of actual regulations set forth by the United States Air Service in 1920.

1. Don't take the machine into the air unless you are satisfied it will fly.

2. Never leave the ground with the motor leaking.

3. Don't turn sharply when taxiing. Instead of turning short, have someone lift the tail around.

4. Never get out of the machine with the motor running until the pilot relieving you can reach the engine controls.

5. Pilots should carry hankies in a handy position to wipe off goggles.

6. Riding on steps, wings, or tail of a machine is prohibited.

7. In case the engine fails on takeoff, land straight ahead regardless of obstacles.

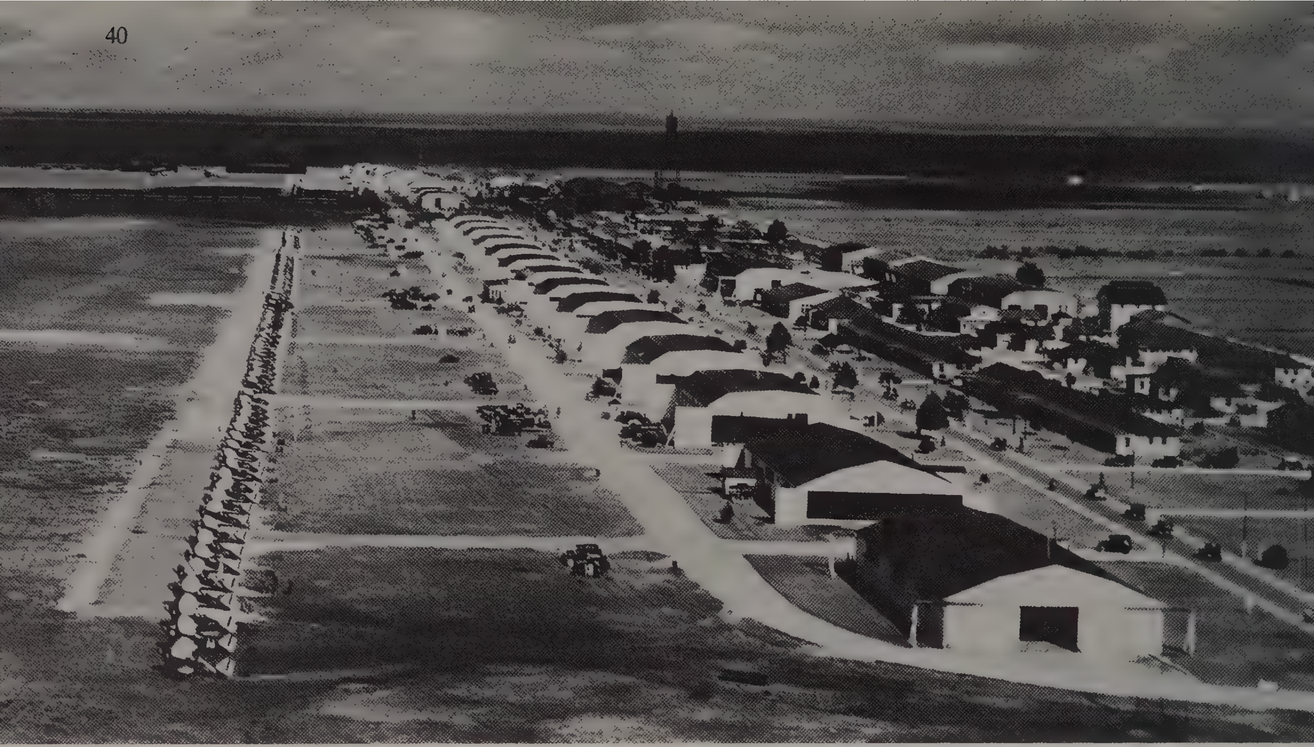
8. No machine must taxi faster than a man can walk.

9. Do not trust altitude instruments.

10. If you see another machine near you, get out of the way.

11. If an emergency occurs while flying, land as soon as you can.

12. Pilots will not wear spurs while flying.



Only minor changes altered the Kelly Field flight line between 1917 and 1940.

B" Plan Training at the Advanced Flying School

The first class under the new "B" training plan entered primary training in November 1927. Eight months of their year-long journey to wings and commission would be at either Brooks or March Field (both replaced by Randolph Field when it opened in 1930). Shortening the course at what was now the Air Corps Advanced Flying School at Kelly Field simply eliminated the weeks spent on transition from primary to basic training. Although General Fechet's plan was to train all cadets at the Advanced Flying School as observer pilots and observers before they went on to specialized training in pursuit, bombardment, or attack, the now-traditional four specialties remained.

By 1927 , the venerable "Jenny" was gone from the primary flying fields, replaced by the Consolidated PT-1, a two-seat biplane powered by a 180 horsepower Wright E engine. The main basic training aircraft until 1930 remained the DH-4, modernized into the DH-4M by using the wings, tail, and engine of the DH-4 on a fuselage of welded steel tubing. Only after reaching Kelly were flying cadets introduced to actual combat aircraft. In the late 1920s these included Boeing PW-9 and Curtiss P-1 pursuits, Keystone LB-5 and Martin NBS-1 twin-engine biplane bombers, Curtiss A-3 attack aircraft, and Douglas O-2 observation aircraft. Flying training was concentrated in the morning hours, with afternoons devoted to classroom instruction on signals, ordnance, and the proper writing of combat orders.

Cadets at Kelly

Cadets arriving at Kelly after surviving the months of primary and basic training immediately noticed differences. For one thing, the facilities, built hurriedly during World War I, were not nearly as nice as those at Randolph. Future General Curtis LeMay came to Kelly in 1929 and found the discipline relaxed in comparison to his experience at March Field. In contrast, Cadet Fred Freyer's class entered shortly after Colonel Henry B. Clagett took charge of the Advanced Flying School in 1932 and found that discipline was even stricter than they'd experienced in the last weeks at Randolph. Clagett, whose nickname was "Sue," was widely known in the Air Corps as a martinet, and he promptly instituted a regular series of formations and limited weekend leave to Sunday. A few weeks later, Clagett relaxed his grip somewhat, giving the cadets Wednesday afternoons and evenings off.

The Curtiss-Martin NBS-1 was the frontline bomber of the 1920s.

Beirne Lay, Jr., a 1933 graduate in the bombardment section who captured his cadet experiences in a 1937 book "I Wanted Wings" and later co-authored the World War II classic "Twelve O'Clock High," noted that the biggest difference between Randolph and Kelly was that, "Hitherto, we had been taught to fly, nothing else. Now, the underlying fact was emerging into our foreground that we had learned to fly an airplane for one reason only, to use it as a weapon." The Advanced Flying School was, he wrote, "school in earnest for military fliers."

The schedule of activities varied somewhat over the years, but typically, cadets rose at 6 AM, breakfasted at 6:15, and policed their barracks before assembly at 6:50. They were on the flight line by 7:00 and flew until 11:00 on days when the weather was good. To simulate bombing practice, cadets sat at a miniature bomb range constructed on the floor of a hangar. Electric lights flashed to show approximately where a bomb would have landed.

Lunch was at 11:40, and the afternoon was taken up with ground school classes from noon to 3:30. Athletics filled the late afternoon, with supper around 5:30. On many evenings, cadets returned to the flight line at 6:00 PM for up to two hours of night flying.

Passing through the Advanced Flying School a year before Lay, Fred Freyer rose earlier, around 5:15 AM, and had an hour of ground school before reaching the flight line about 7:30. Lights out in the barracks was at 9 PM, although the cadets could stay up until 10 o'clock. Since it was impossible to continue studying in the dark, and most cadets were pretty tired anyway, they typically turned in at lights out.

The Ruggles Orientator was used to test cadet's reactions during violent manuevers.

Cadet barracks were of 1917 vintage and rather spartan, even by the standards of the period.

Discipline and Relaxation

Above all else, cadets were stimulated by their love for flying: which helped them overcome the deaths and dismissals of fellow cadets as well as the constant intrusion of military spit-and-polish; something few had any real interest in. Incoming cadets were known as "Dodos" for the first month of training, which Fred Freyer described as "lower than a freshman in military college." Cadets who failed to maintain an immaculate bunk or foot locker, or who offended an "upper class" cadet or instructor, got demerits. Every five demerits resulted in an hour walk around the barracks, and Freyer recorded the lament of every new trainee when he claimed that he was "gigged" even when he was innocent.

During the first thirty days, all new cadets were restricted to the post and had to get permission to leave the barracks. Roused at 4:40 in the morning, the first activity was a mile run--a sequence familiar to anyone who has passed through military training. By the time a cadet progressed to the basic flying course, they got regular leave on weekends, although discipline was still strict. Leave was also granted around the Christmas holidays.

The demerit system used at Brooks and Randolph was also followed at Kelly. In addition to walking "tours" of varying lengths of time, cadets guilty of infractions at the Advanced Flying School were often simply restricted to barracks or ordered to write essays acknowledging the error of their ways. Freyer was accused of not taking off exactly on time for a cross-country flight (although he vehemently protested his innocence) and was forced to write a 1,000 word essay on "Airdrome Discipline."

On the other hand, cadets did not always let restrictions keep them from their social whirl. Two weeks after writing his essay, Freyer found himself restricted for the weekend. He did not, however, "let it keep me from what I wanted to do. Had a date Saturday night and also Sunday." Freyer was hardly unique in sneaking out, and his technique of making up his bunk to simulate a sleeping form was practiced repeatedly by cadets. Cadet William Yancey, a graduate with Class 38-B, recalled a group arguing with the cadet officer-of-the-day in an effort to get themselves "off the 'returned after hours' list." Stretching the rules to the limit, or even beyond, was the way the game was played.

Beverley
Beal
Hackman
Connell.

A Kelly Field polo team. Circa 1930.

The Sport of Kings and Airmen

During the interwar years, a military officer was expected to carry on many of the traditions of a gentler age, one when officers were indeed gentlemen. Although many of these traditions are still with us, many more have vanished as a result of changes in societal expectations. Among the vanished aspects of being an officer is the emphasis on horsemanship, and its associated fascination with the sport of polo.

Polo was an important sport at nearly every Army post during the 1920s and 1930s, and Kelly Field was no exception. As former commander George Beverley remembered, polo at Kelly began while Major William Garrison commanded the depot on Duncan Field. An avid enthusiast, Garrison persuaded Fort Sam Houston to lend the field thirty-five horses, which were stabled at Duncan Field just north of the Bungalow Colony. The team practiced and played on a large field that then occupied the area across the street from today's Security Police Headquarters, building 105. Prior to the late 1930s, the land between today's Duncan Drive and the Kelly Field flight line was completely empty and made an excellent riding area.

The Kelly polo team actually represented all Air Corps installations in the San Antonio area. Clad in the aviation colors of blue and gold, the team gave a good account of itself in several well-publicized matches, winning the Southwestern Midwinter Tournament in 1929 and 1930 and, at one point, going undefeated for nearly a year. Making this string of successes more remarkable was the relatively poor quality of the team's borrowed horses.

By 1937, the home of the polo team had shifted to Randolph Field, although its members continued to come from all the local Air Corps fields. The first game on the new field took place on May 19, 1937. Perhaps it was the absence of Beverley, a superb ride and goal-scorer, but this Air Corps team was trounced soundly by the San Antonio club team, 6 to 1. The "Glory Days" of Kelly's polo team were over, and within a few years, polo itself began to disappear as the Army and the Air Corps moved away from the equestrian arts toward the harsher arts of war.

In the 1920s, flying cadets were identifiable by the white band on their caps and a blue armband carrying aviation insignia embroidered in yellow-orange thread.

Whatever cadets had to say about their instructors, officers, or Kelly in general, they all agreed that the food was good. Future General George Beverley recalled Sunday breakfast with particular nostalgia--as did LeMay--while Beirne Lay recalled lunches of "the tenderest of steaks...chicken, duck, or broiled lobster, and...a profusion of all the fresh vegetables in the seed catalog." The cadet's mess at Kelly was, he wrote, "the gourmet's millennium, the promised land." During the Depression, this kind of food was an added benefit.

On the Flight Line

Flying was, of course, the reason they were there, and cadets enjoyed their time in the air most of all. In addition to flying the aircraft of their specialty, cadets had the opportunity to fly the aircraft of the other sections, too. Lay recalled the nimble P-12 pursuit plane with particular affection. Cadets ended up in one of the four specialized sections partly through choice and partly on the basis of evaluations made by their instructors during basic flight training. Lay chose bombardment because he thought it would help him get a flying job with an airline; he took great pride in controlling the twin-engine Keystone bomber, "learning within six inches where the wheels were on a landing, even though we sat twelve feet above those wheels." Freyer ended up in the attack section, but found flying the bombers "a lot of fun." Cadets, however, almost universally acknowledged that pursuit was the most glamorous specialty.

Advanced students did get some actual experience with bombs and guns, although only a handful of the training aircraft were ever armed. Armorers in Hangar 16 reinstalled the guns for specific training exercises, but Donald Herbert, who served in the armament section in 1940, recalled that no loading of live ammunition took place at the field. During the early 1920s, the empty fields immediately west of Kelly served as a bombing range, but the "bombs" dropped there were mainly inert training bombs. A few did contain picric acid explosives, though, and

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13

Night flying technology in the 1920s and 1930s forced pilots to rely on their skills and instinct.

CDT BARTON
CDT AIGELTINGER
CDT BEAR
CDT BOOKER
CDT. NEWLAND
CDT. HOYT
CDT. LAMBE
CDT. LAY
CDT. HAMILTON
CDT. DAVIS
CDT. CRAIN
CDT GIBBON
T SGT SIEBENALER
M SGT. SMITH
BOMBARDMENT
JUNE CLASS 1933
KELLY FIELD

Cadet Beirne Lay, Jr. graduated with the Bombardment Section in June 1933.

during construction of the San Antonio Aviation Cadet Center on the old range in 1941, Herbert had the unenviable task of supervising the recovery and disposal of the munitions found in the area. By the 1930s, though, the Air Corps used a range at Matagorda Island off the south Texas coast for gunnery and bombing practice. To provide some training in "leading" a moving target, the Air Corps used a skeet range, a practice which began during World War I. Herbert recalled that each pilot was authorized some 600 rounds of twelve-gauge ammunition annually, and just before bird or duck season the range would be crowded with eager shooters--including most of the base staff officers and instructors.

Vagaries of Navigation

One of the consistent features of advanced training was cross-country flying, often at night. George Beverley, an instructor in 1930 who would return to command Kelly at the end of World War II, recalled leading groups to Love Field near Dallas during the day, eating supper, then, at dusk, having the students take off individually for a return to Kelly after dark. The students could rely partially on their compasses, but their primary route indicators were lights on the highway and beacons at the various emergency fields along the way. "The landing lights at Kelly were very primitive," recalled Beverley, "but we managed to get by with very few accidents and no casualties among the students."

Flying Cadet Freyer was considerably less sanguine. Writing to his mother shortly before his first night cross-country flight, he tried to ease her mind by telling her not to worry, but at the same time glumly assuming that "some of us [will] get lost and have to land somewhere before our gas runs out." He explained that they all had flares and wing lights, but closed that portion of his letter by talking about his parachute; sentences that were undoubtedly less reassuring than he intended. Fortunately, eight days later he was able to write that the two-hour flight from Galveston had been utterly uneventful.

Things did not always go so well. Cadet Royal Leonard, a pursuit graduate in 1928, wrote about a cross-country flight to Fort Clark, Texas, in which a number of cadets strayed over the Mexican border. "Out in those wild mountains," he wrote, "it takes some pretty good navigation to find it." His own navigational difficulties on another flight were ascribed to a faulty compass. Fortunately, it was still daylight, and Leonard could finally land and ask a nearby farm family where he was. Beirne Lay, Jr. remembered awakening one morning to find the entire observation section lost on an overnight flight from Galveston. As it turned out, a strong cold front came through that night, and to save money the airline beacon line between San Antonio and Austin had been turned off. Luckily, no one crashed. Many had come down on emergency fields. A pair of cadets even managed to successfully fire off flares to light their way into dark landing areas. One young flyer actually ended up in Laredo, blown almost two hundred miles south of his apparent route by the strong northerly wind.

Mishaps and Tragedies

Training aircraft of the late 1920s and early 1930s were sturdier than their predecessors and equipped with more powerful and reliable engines. Yet, in many ways their steel frame construction was less forgiving in a crash than the light wood-and-canvas construction of earlier aircraft. By mid-1937, of some 2,051 cadets entering flight training at the Advanced Flying School, thirty-nine had died in aircraft accidents. One 1933 night cross-country flight from Fredericksburg to Kelly ended in tragedy when Flying Cadet Charles Rogers crashed his O-2 in fog shortly after take off. On that same flight, Cadet Lawrence Fulwider, caught in the same fog, was able to bail out safely. His escape was pure luck. Climbing to 2,000 feet, out-of-gas, Fulwider jumped and hit the ground moments after his chute opened. In the morning he discovered that he had come down, just by chance, in a small valley between two hills, both of which peaked at over 2,000 feet.

"It could be as cold and hard as ice."

Colonel Carl J. Crane

Carl J. Crane, a native of San Antonio, Texas, entered the Air Service as a second lieutenant on June 15, 1924. Following flight training at Brooks Field, he graduated from Kelly's Advanced Flying School in September 1925. After a tour with the 1st Pursuit Group at Selfridge Field, Michigan, Crane served as a flight instructor at Brooks, Kelly, and Randolph Fields. While at Kelly, he served as a technical adviser and pilot during the filming of the silent motion picture classic "Wings."

Working with William C. Ocker, Crane paved the way for the initial adoption of instrument flying textbook, "Blind Flight in Theory and Practice," published in 1932. While at Wright Field in Ohio, Crane designed, co-engineered, and, on August 23, 1937, test flew the world's first fully automatic landing system, earning the Mackay Trophy and Distinguished Flying Cross for this accomplishment.

Throughout his long and distinguished career, Crane flew with almost every experimental and production flight data display during his day and held over 100 patents of aviation instruments. Colonel Crane retired in 1949 but continued active studies in research on flight control and guidance instrumentation. He died in 1982.

Colonel William C. Ocker

William C. Ocker joined the Army in 1988, joining the Aviation Section of the Signal Corps in 1912. His flying career began as a corporal at North Island, California, where he served as an aviation mechanic at the Army's flight school. In appreciation for his mechanical assistance, Curtiss instructors taught him to fly, and Corporal Ocker qualified for his pilot's license in 1914, becoming one of the first enlisted pilots.

Commissioned during World War I, Ocker became deeply concerned with the high fatality rate of his fellow pilots. Convinced that many of these deaths were due to a lack of instrument flying skills, he set out to improve flight safety. He was the first pilot to associate vertigo and disorientation with "seat of the pants" flying in poor visibility. Working with fellow "blind flying" enthusiast Carl Crane, he crusaded long and hard to convince Air Corps leaders to incorporate instrument flight instruction into the flying training curriculum. Ocker was the first to flight test Dr. Elmer Sperry's original bank and turn indicator and used it to build a "Vertigo Stopper Box." He was also the first to devise and test a canvas cockpit enclosure, making it possible to conduct "blind flying" experiments safely.

William Ocker died in 1942, having witnessed the acceptance of his theories and their inclusion into the training program at the Advanced Flying School.

The aerial pass-in-review was one of the highpoints for spectators at graduation ceremonies. This review took place during the graduation of February 1939. The aircraft are Martin B-10s.

Graduation

Graduation and commissioning ceremonies were impressive. Invitations were carefully printed, often including a photograph of the field. The day before, each class gathered for a formal group portrait. Even at this point, cadets might still fail to graduate. LeMay remembered one member of his class who was ordered to leave for violating flying regulations the night before the ceremony, but this was a rare occurrence.

The high point of the graduation exercise during most of the 1930s was the fly-by, in which all the sections roared past the reviewing stand. The bombers came first, in stepped up three-plane Vs, the first trio only a few feet off the ground. Then came the pursuit planes, followed by the attack section, and finally the observation section. An hour later, the class, most in brand-new uniforms, with brass gleaming, assembled for an address from the Chief of the Air Corps. At the end of the general's speech, the flying cadets came forward, one at a time, to receive their wings and commissions. A lucky handful would go on to active duty careers. Since regular officers completing the course had first call on available flying slots, many of the former cadets soon found that they were in the relative obscurity of the reserves. For all of them, though, the year of tension was over.

Organizational Changes

The organizational structure of the Advanced Flying School changed several times in the 1930s as the Air Corps grappled with depression-era budget restrictions followed by expansion during the last years of the decade. From the mid-1920s, the Army planned to place all flying units under an organization known as General Headquarters Air Force (GHQ AF) if war broke out. However, it was not until the early 1930s that GHQ AF existed as more than an amorphous "paper" organization. However, at the persistent urging of senior Air Corps officers, the Army created a provisional headquarters GHQ AF as a peacetime organization in 1933, making it a permanent part of the peacetime Army on March 1, 1935.

The new GHQ AF controlled all Army tactical units, which were organized into three wings and an airship group. The Air Corps continued to supervise the logistics and training functions--including the Advanced Flying School at Kelly as part of the 24th School Wing. The squadrons at Kelly lost their school designations, but kept their numeric designations. The 43rd School Squadron, for example, became simply the 43rd Pursuit Squadron, GHQ AF on temporary duty at Kelly Field. A year later, though, on September 1, 1936, the 39th through 43rd squadrons were inactivated and reassigned to GHQ AF. Replacing them at the Advanced Flying School were four school squadrons, the 61st through 64th. At the same time, the Air Corps inspector general suggested that specialized bombardment training end in anticipation of a single course of instruction at the Advanced Flying School, utilizing a single "all purpose" trainer. General Frank Andrews, Commander of GHQ AF, supported a policy under which new pilots headed for bomber units would spend a year or more flying pursuit or attack aircraft with tactical units before heading to a bomber unit. However, some specialized training in bombardment continued at Kelly until June 1940, when all specialized training at the Advanced Flying School ended.

The argument in favor of ending specialized bombardment training at Kelly was based in part on a renewed emphasis on the role of the bomber in Air Corps doctrine, and in part on the aging aircraft used for bombardment training at the school. By the mid-1930s, the slab-sided, twin-engine, biplane Keystone and NBS bombers flown with such pride by Beirne Lay were wholly obsolete. In 1934, the Air Corps began taking delivery of the Martin B-10, an all-metal, twin-engine, monoplane bomber with a power turret in the nose. Three years later, the Douglas B-18, a derivative of that company's DC-2 airliner, began to enter the inventory. Even as the twin-engine

The BC-1 (Basic Combat-1) appeared at the Advanced Flying School in 1938.

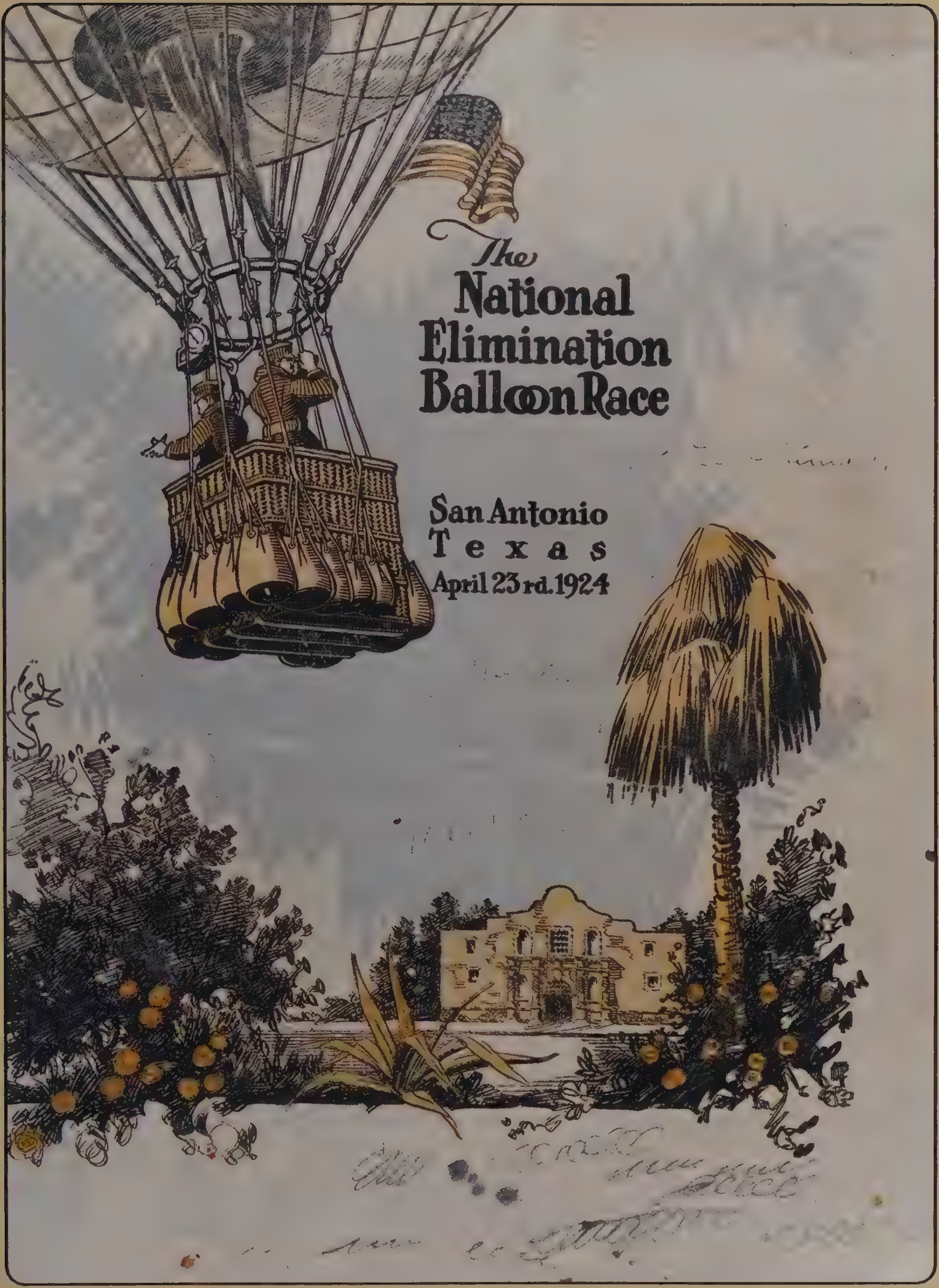
The rugged BT-8 was flown at Kelly from 1936 through the end of the decade.

B-18s appeared, Air Corps officers were excited by the possibilities of the four-engined Boeing XB-17.

During these years, however, few changes took place in the aircraft flown at Kelly's Advanced Flying School. For most of the 1930s, pursuit students continued to rely on the nimble P-12, although a few P-26As appeared at the field during the middle years of the decade. The Air Corps also began acquiring the Seversky BT-8 trainer in 1935. This was the first monoplane trainer used by the Air Corps, but it was in no way an advanced pursuit trainer. (Retired Colonel T. E. Gurnett, a 1938 graduate, recalled the pairing of the P-12 and BT-8 as "quite a combination, a feather and a truck." The BT-8 was, indeed, a rugged aircraft. Gurnett described one incident in which a cadet literally flew into a hangar, which tore off his fixed landing gear, and pancaked onto the landing field. The cadet walked away with only a small scratch.)

Bombardment students also had to rely on older models, as did attack and observation students. The Keystone LB-5s and LB-6s flown by Lay were still in use as late as 1938. (Kelly managed to obtain a pair of B-18 bombers in 1938, and two Martin B-10s were also at the field in 1940. The latter were not, however, used for training; they served as target tugs during air gunnery practice.) Attack students flew A-12 "Shrikes" dating from 1934, and observation students flew the O-25, a two-seat biplane variant of the Douglas O-2 dating from the late 1920s. By 1937, though, things began to change. The shift was gradual at first, but within two years the field so many flying cadets recalled with fondness would be in the midst of an expansion program that would leave it almost totally transformed.

The nimble P-12 was the last biplane pursuit used by the Air Corps.


The
National
Elimination
Balloon Race
San Antonio
Texas
April 23rd. 1924

Flying Events and Extravaganzas

Air Service enthusiasm for exciting, crowd-pleasing aerial displays continued throughout the 1920s, a decade in which public interest in aviation grew steadily. To some extent, the air shows and demonstrations of the 1920s reflected the same desire to lure in new recruits which had motivated the "air circuses" of the immediate post-war years. But, Air Service, and later Air Corps, pilots were also among the nation's leaders in pushing the frontiers of flight forward during these years, and aerial displays of flying skill served as reminders of the contributions and skills of America's military flyers.

As one of the centers of Army aviation, Kelly Field naturally played host to a number of such air shows. One in 1923 featured acrobatic displays by pursuit pilots, parachute jumps, and an aerial refueling demonstration, along with displays of aircraft. During the show Lieutenant Wagoner died in the crash of his plane.

This tragedy did not prevent the field from hosting another display in April 1924, featuring the start of that year's National Elimination Balloon Race. Held in conjunction with the annual Fiesta Week, the race was to select an American team to compete in the International Balloon meet in Belgium for the James Gordon Bennett Cup. Along with the balloon race, Kelly Field pilots participated in a series of aerial displays, featuring air races, parachute jumps, and a massive aerial review. Participants included Major Lewis H. Brereton (who was in charge of the military police detail for the meet and would later command American forces in the Pacific during World War II), Major Frank Andrews (executive officer for the meet), Edgar G. Tobin (assisting in the coordination of the flying events), and Lieutenant Clements McMullen (who would serve as Kelly's commander in the 1940s and again in the early 1950s.) Over 74,000 people took advantage of reduced railroad rates and the good weather to visit the field. Although hopes that the race would break the existing distance record for free-ballooning went unrealized, W. T. Van Orman of the Goodyear Tire and Rubber Company, traveled 1,072 miles, landing five miles south of Rochester, Minnesota. The leading Army team, headed by Major Norman W. Peek, landed five miles south of St. Ansgar, Iowa--1,021 miles from Kelly.

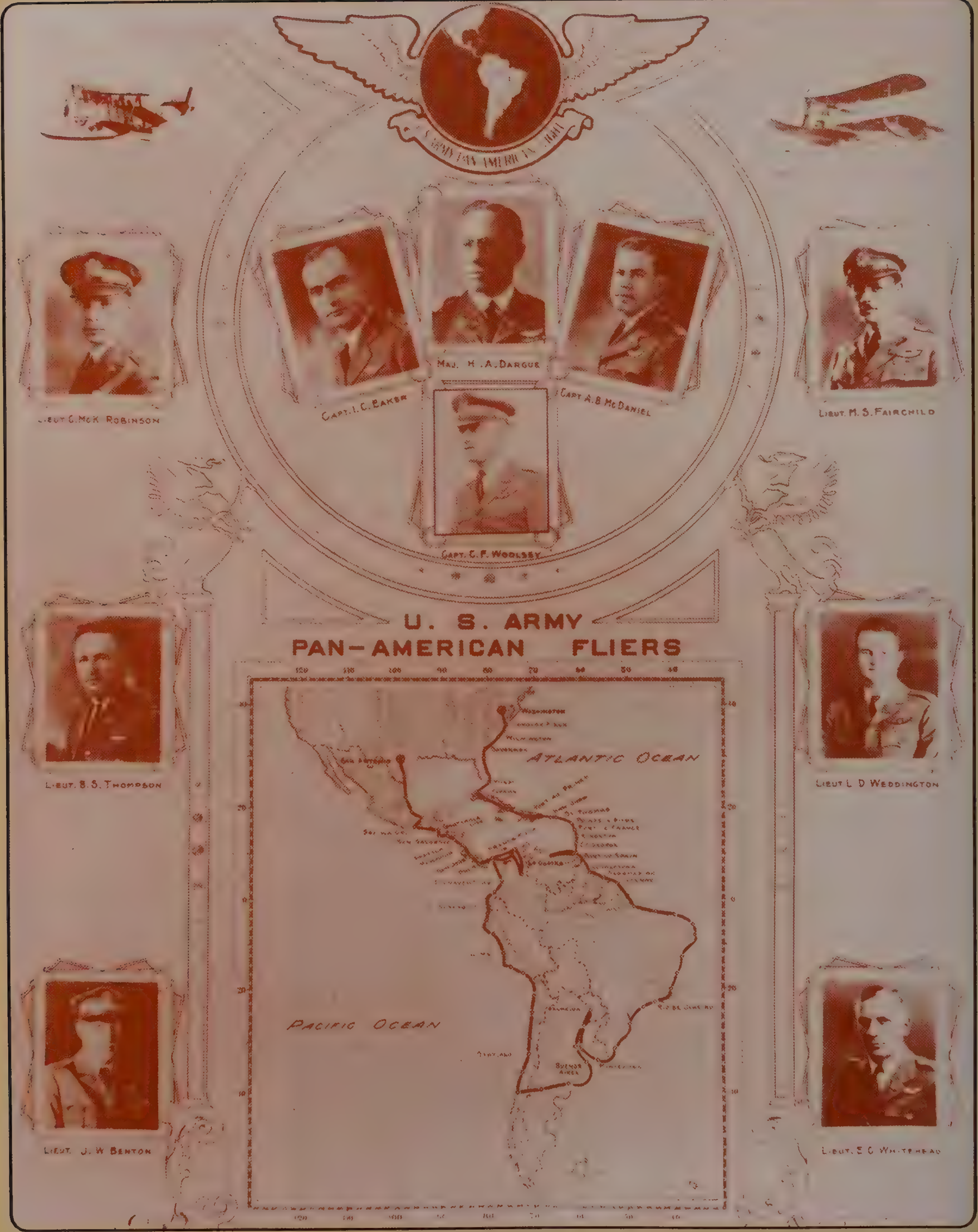
Trans-Continental Efforts

Air Service pilots were among those excited by the challenge of flying faster and farther with each improvement in aircraft speed and reliability. This urge dovetailed neatly with Air Service interest in finding out how quickly aircraft could be shifted between locations.

Beginning in 1921, a pair of Air Service flyers attempted to fly from western bases to the East Coast. Lieutenant Alexander Pearson, flying from Jacksonville, Florida, to San Diego, California, came down with engine trouble along the Rio Grande. Lieutenant William Coney also suffered engine trouble while crossing Texas, but eventually reached Florida with only twenty-two hours and twenty-seven minutes of actual flying time--a record at the time.

In August 1922, Lieutenant James H. Doolittle, already famous throughout the Air Service as a daredevil, made an attempt to break this record. In contrast to his reputation, Doolittle made careful preparations, flying the route beforehand to check landmarks and rebuilding his DH-4 at McCook Field, Ohio, and Kelly Field. After a propeller failure ended a first attempt, Doolittle tried again in early September, taking off from Jacksonville and landing twenty-two hours and thirty-five minutes later at San Diego. His only stop was at Kelly, where he spent only eighty-five minutes for fuel and service.

Jimmy Doolittle (second row, standing, third from left) and Kelly personnel, who helped prepare his plane for his 1922 coast-to-coast flight.


LIEUT. C. McK. ROBINSON
CAPT. I. C. EAKER
MAJ. H. A. DARGUE
CAPT. A. B. McDANIEL
LIEUT. M. S. FAIRCHILD
CAPT. C. F. WOOLSEY
U. S. ARMY
PAN-AMERICAN FLIERS
LIEUT. B. S. THOMPSON
LIEUT. L. D. WEDDINGTON
LIEUT. J. W. BENTON
LIEUT. E. C. WHITEHEAD
WASHINGTON
SAN ANTONIO
ATLANTIC OCEAN
PACIFIC OCEAN
RIO DE JANEIRO
BUENOS AIRES

Pan American Goodwill Flight

After a successful around-the-world flight in 1924, the next major international tour was the Air Corps Pan American Goodwill Flight in the spring of 1927. Publicized as an effort to demonstrate the feasibility of commercial air transportation, as well as the progress of aviation within the United States, the flight also demonstrated the reach of American military airpower. Five Loening OA-1A amphibian aircraft left Kelly Field on December 21, 1926, bound for Panama. Over the next several months, the airmen visited twenty-three Latin American countries, bearing a greeting from President Calvin Coolidge. Breakdowns plagued the flight, though, and a mid-air collision over Buenas Aires killed two of the team members. The flight returned to Bolling Field, outside Washington, D. C., on May 2, 1927, met by an enthusiastic crowd. Whatever public relations benefit the flight had for the Air Corps was, however, fleeting. Public attention was already focused on the pilots and aircraft gathered at New York to challenge the Atlantic, and Lindbergh's triumphant solo flight on the night of May 20-21 totally eclipsed all news of the Goodwill Flight.

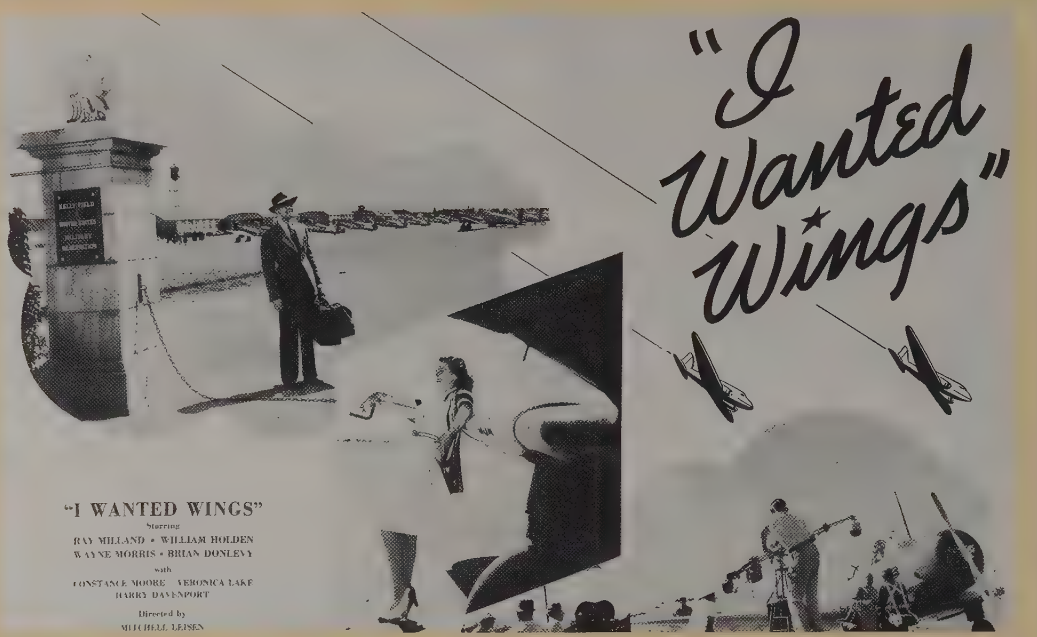
The excitement of "Wings" was partly due to innovative aerial photography.

Hollywood Comes to Kelly

For the people of Kelly, the high point of the late 1920s was undoubtedly the arrival of a crew from the new national film capital of Hollywood to cinematically recreate World War I for the epic silent picture "Wings." The choice of Kelly as a central location made good sense. Not only was the field the most important site for flight training during the war, it was still home to the Advanced Flying School. A large pool of skilled instructor pilots was available, both at Kelly and nearby Brooks Field. In addition, Fort Sam Houston was only a few miles away, and the soldiers of the 2nd Division were available to participate in battle-scene filming at the Leon Springs training ground (now known as Camp Bullis).

Far from reluctant to cooperate, the Air Corps made planes and pilots available to director William Wellman on a lavish scale. A few pilots and aircraft came from the 1st Pursuit Group at Selfridge Field, Michigan, including a young lieutenant named Carl Crane (who would later, with William Ocker, help formulate the first instrument flying curriculum for the Air Corps). These men and planes served as "Germans" during filming. Dozens of others from all over the country joined them to fly as Allied airmen. A handful of the best "doubled" for the leading actors in aerial scenes. Future General Hoyt Vandenberg, then an instructor at Brooks, was one of them, as were E. J. Rogers and Earle Partridge; who both retired as general officers.

For some scenes, these men sat in the front cockpit of a trainer, operating a camera mounted over the cowling and ducking down when it was on so that the actor in the rear cockpit was visible "piloting" the plane. In another scene, Vandenberg simulated being shot down, triggering the camera and releasing a bag of soot to resemble smoke. In this case, Vandenberg dumped the entire contents, blinding himself. As he struggled to breathe and clear the cockpit from the choking dust cloud, his plane veered all over the sky. Luckily, Vandenberg recovered control before crashing. The film crew was jubilant; as he climbed down, still gasping for air, Vandenberg was eagerly asked if he could do it again. Other pilots were not as fortunate. During filming of the climactic scenes recreating the battle of St. Mihiel, one pilot was killed in a crash; and Wellman remembered another pilot crashing when, caught up in the drama


"I Wanted Wings"
"I WANTED WINGS"
Starring
RAY MILLAND • WILLIAM HOLDEN
WAYNE MORRIS • BRIAN DONLEVY
with
CONSTANCE MOORE VERONICA LAKE
HARRY DAVENPORT
Directed by
MITCHELL LEISEN

"I Wanted Wings" offers some of the last remaining footage of activities along the old Kelly flight line.

The film crew stayed on location for several weeks waiting for clouds to appear, with Wellman taking charge of tackle football games on the concrete parking ramps against teams from Kelly, Brooks, and Fort Sam Houston. Finally, though, the weather cooperated, Wellman got his scenes shot, and the men and planes could return to more normal duties. "Wings" premiered in San Antonio in July 1927 and was shown nationally throughout 1927 and 1928 to rave reviews. In May 1929, it won the first academy award for best picture; the only silent film ever so honored.

Although Kelly played no major role in aviation events of the 1930s, it once again played host to Hollywood in the fall of 1940 for the filming of Beirne Lay's screenplay of his memoir "I Wanted Wings." Large portions of the film were shot at Randolph Field, following the progress of class 40-D. Later scenes were shot at Kelly, incorporating the mass fly-by of the graduating class. Like "Wings," "I Wanted Wings" premiered in San Antonio (in March 1941). It, too, received high praise from film critics, became Paramount's top-grossing film of the year, and was honored by an academy award--in this case for special effects.

Expansion and Growth

The Air Corps willingly provided cooperation in the making of "I Wanted Wings" out of the same desire to spur recruiting efforts that had motivated the aerial shows of the early 1920s. By 1940, Kelly was in the midst of an expansion that was transforming the entire Air Corps as part of a national rearmament program to meet the emergent threat of Nazi Germany and Imperial Japan.

The need for improvement was evident by 1937. Many of the facilities, including nearly all the hangars, barracks, and offices, dated from World War I. Dilapidated and worn, they were, in the words of the Air Corps Inspector General, "on [their] last legs." Old age, dry rot, and the ravages of ants and termites made many of the hangars, too small in any case, hazardous.

Some improvement was already underway. Although funds allocated to the Works Progress Administration (WPA), a New Deal public works relief program, could not be used to purchase supplies or machinery, they could be used for the construction of buildings. While some funds went toward temporary reconstruction of older buildings, the most visible result of the WPA's presence at Kelly was a miniature range building completed in May 1937. Although for years rumors abounded that the structure was a "bombing tower" for the instruction of bombardiers, the truth is more prosaic. Octagonal, eighty-five feet high, and sixty-three feet across, the hollow-cored building had a revolving terrain map with hundreds of small light bulbs at the bottom. Metal balconies circled the inner core at three levels. Student observers sat at small desks on the balconies, each student with his own morse key. As the miniature terrain slowly revolved below, instructors triggered a prearranged sequence of the light bulbs to simulate artillery or bomb explosions. The students then telegraphed what they saw, with the instructors rating them on the accuracy of their observations. It never served as a training aid for bombardiers.

Ironically, its service as an aid for observer students was also brief. By 1937, Air Corps enthusiasm for observation had faded, replaced by the emergent doctrine of strategic bombardment built around the four-engine heavy bomber. (Even the once romantic pursuit mission got increasingly short shrift at the Air Corps Tactical School during these years.) Within two years the building was used solely to train pilot candidates in morse code, and trainees of the early 1940s cannot recall it being used at all. Today it remains a unique landmark at Kelly, mute testimony to the passing of what once was a critical mission of the Army's air arm.

Other permanent improvements to Kelly began to emerge out of funding appropriated by Congress in 1938. Brigadier General James E. Chaney, commander of the Air Corps Training Center, recommended that priority go to the construction of a barracks for enlisted men, a separate barracks for aviation cadets, a headquarters building, a set of senior officer quarters, and a row of non-commissioned officer quarters. Construction of the quarters began in July 1938, and construction of the other buildings, including a large hangar, got underway during the spring of 1939. All were complete by the middle of 1940. Fifty years later they are still in use, largely for their original purpose. The large enlisted barracks, so superior to the drafty World War I facilities, soon became known as "Buckingham Palace," and it remains "The Palace" fifty years later, still serving primarily as an enlisted barracks. The headquarters/administration building houses the San Antonio Air Logistics Center headquarters, the officer and noncommissioned officer quarters still serve as quarters, and the large hangar houses the flight operations center. The one-time cadet barracks still serves as visiting officer quarters, but also contains the officers' club.

As the erection of these permanent structures continued, Air Corps expansion went forward. Although prior to 1939 the number of new pilots graduating from Kelly never exceeded 350 in any year (and was often less than 200 per year), Air Corps planners anticipated a need for at least 1,200 pilots per year. Accordingly, Air Corps Chief General Henry H. "Hap" Arnold, initiated discussions with

In 1937, Kelly was still a rural enclave, not far removed from its pastoral origins.

The unique miniature range building was for observer training, not (despite persistent rumor) for bombardier training.

the operators of civilian flying schools in the fall of 1938, asking them to prepare to provide primary flying training for prospective Army pilots. Congress approved this step in April 1939, and the first nine schools began training Army flyers by the summer.

The outbreak of war in Europe in September added even further impetus to American military expansion. For the next two years the Air Corps, which became the Army Air Forces in June 1941, prepared a series of increasingly ambitious expansion plans which superseded each other with dizzying rapidity. In March 1940, the Air Corps submitted a revised expansion plan to the War Plans Division, calling for 7,000 pilots per year and forty-one combat groups by the end of December 1941. In June 1940, the Air Corps proposed a goal of fifty-four combat groups by April 1942, and a pilot training target of 12,000 per year. Known as the First Aviation Objective, this proposal, too, soon gave way to the pressure of events. By February 1941, the pilot training goal was set at 30,000 per year, a hundred times the levels attained during the 1930s.

A revolving three-dimensional terrain model used small lights to simulate the flashes of artillery and bomb explosions for student observers.

The impact of these plans on Kelly's Advanced Flying School was severalfold. It was clearly impossible for a single school to provide advanced training for this number of pilots, and the Air Corps began developing a network of basic and advanced schools around the country. Eventually, seventy-two new Army flying fields would exist to absorb the influx of candidates coming from civilian-run primary schools. Further, in May 1940, the Air Corps modified its existing training organization by creating two new training centers on the east and west coasts. The former Air Corps Training Center at Randolph became the Gulf Coast Air Corps Training Center--part of an eventually larger, centralized training command. Kelly's primacy as the "Alma Mater" of the Air Corps faded as it became only one of an increasing number of advanced schools.

Although Kelly no longer played a central role in pilot training, for almost two decades it had been the final stop for young men hoping to gain a commission and wings. By the end of 1940, 5,568 men became Army aviators at Kelly Field. The vast majority of the men who would lead the Army Air Forces during World War II, and later lead the newly independent Air Force, passed through Kelly. Many served at the field more than once. All shared warm memories of their days as flying cadets. All were part of an abiding part of Kelly's heritage; of a time when the sky over the field was filled by young men who just wanted to fly.

A World About to Disappear: BT-8s fly in formation over Kelly. In a few brief years, they and the mule would be obsolete and the Kelly landscape forever altered.

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CHAPTER THREE

FOUNDATIONS OF DEPOT MAINTENANCE

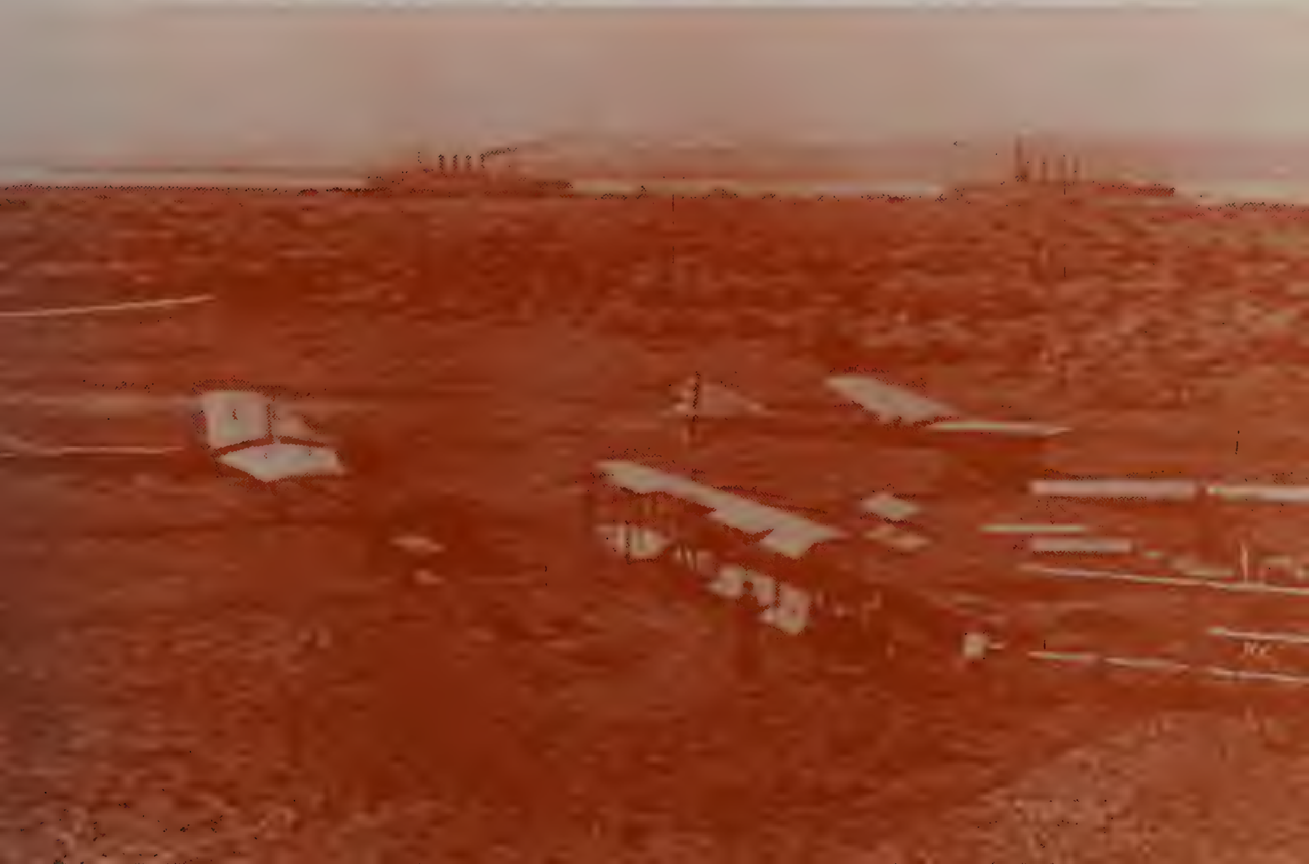
Almost from the very start, aircraft maintenance played an important role in the story of Kelly Field. Among the young pilots arriving to join the newly-created 3rd Aero Squadron at the field in the spring of 1917 was a Nebraska National Guard officer named Edgar Bagnell. A one-time auto racer, Bagnell learned to fly at the small Army training field at Mineola, New York, in 1916. Like many other flying National Guardsmen, Bagnell, nicknamed "Happy," became a member of the Signal Officer Reserve Corps--the earliest forerunner of the Air Force Reserve/Air National Guard--created by the National Defense Act of 1916.

After training at Mineola through the winter, Bagnell joined the 3rd Aero Squadron on May 11, 1917. In San Antonio, his mechanical skills made him a logical choice as the engineering (or maintenance) officer--the first man to fill the position at the new field.

Early Maintenance in the Aviation Section

The position filled by Bagnell was a relatively recent innovation within the Aviation Section. Early arrangements for supply and maintenance reflected the hazy status of Army aviation, as well as the focus on the training of pilots rather than the development of skilled ground technicians. Pilots did much of their own maintenance; indeed, Air Service General Order Number 1 stressed that if a young officer was "the sort of person who likes to keep his hands clean, don't take up aviation." Benjamin Foulois later recalled that his verbal orders to take Aeroplane Number 1 to San Antonio in 1910 had included the admonition to also "take plenty of spare parts," but found that this portion of his instructions was overlooked. No spare parts arrived at Fort Sam Houston for two months. Allocated only $150 to maintain the airplane in 1910, Foulois spent all his government

North Island (later, Rockwell Field) was the home of the first Aviation Section maintenance organization in 1914.



funds within four months, and had to contribute some $300 of his own money to keep the machine in the air.

Aircraft maintenance was the responsibility of the pilot and his ground crew, assisted by representatives from the manufacturers. Foulois and his small contingent of enlisted men at Fort Sam Houston, for example, enjoyed the help of Eugene Ely of Curtiss and Frank Coffyn of Wright. And, when the Aviation Section opened its small flying school at North Island in 1913 (also the home of the 1st Aero Squadron), it could rely on the facilities and personnel of Glenn Curtiss' for a large proportion of its support. For monthly rent of $25, the Army gained the use of Curtiss hangars, tools, and machinery. Of course, the sheer mechanical simplicity of early aircraft was also a factor. The only complex item was the engine. Early aircraft had no instruments. As a guide, pilots tied a piece of string to the plane and used it to gauge their direction and drift. As Royal Frey drily points out in his survey of early aircraft engineering, this string required no maintenance.

In June 1914, the Aviation Section brought in two civilians, Grover Loening and Oscar Brindley, to restructure the training and maintenance effort at the San Diego school. Seeking skilled mechanics, they promptly hired nine civilians and established an Experimental and Repair Department, with Lieutenant Thomas DeWitt Milling as the officer-in-charge. This department took over responsibility for testing new aircraft and repairing and overhauling the training aircraft at the school. Ground crews continued to make necessary minor repairs and carry out routine preventive maintenance, while a Motor Overhaul Shop under Lieutenant Douglas Netherwood carried out engine overhauls. This new arrangement was the first attempt within the Aviation Section to institutionalize maintenance, although the men of the military ground crews still had to learn their skills "on the job."

At this point the machine shop doubled as an instructional center; a practice that cut into the time allowed for actual repair work. In mid-1915, though, the Aviation Section separated the two functions, and, for the first time, adopted a detailed set of examination requirements for "aviation mechanicians." Enlisted men of any rank could qualify for a practical test administered by a board of officers. These men repaired and maintained aircraft and engines under the supervision of squadron officers and the chief of the machine shop.

Maintenance crews at Kelly used tent hangars until more permanent facilities were built.

The first maintenance department was located on Kelly Number 1. It moved to Kelly Number 2 in 1917 but returned to the original site after the war.

Maintenance Organization on the Eve of War

As the largest tactical unit in the Aviation Section, the aero squadron carried out its own maintenance. According to War Department General Order Number 55 in October 1916, and based in part on the recommendation of Foulois after his experiences in Mexico, each squadron was to have a depot section of three officers and twenty men, but these sections did not accompany the squadron into the field. Instead, they would remain at a location in the rear where they could maintain reserve aircraft coming in from the factory and funnel supplies forward to the flying sections of the squadron. As yet, they did not serve as general repair depots. Aviation schools, three of which existed at the end of 1916, had their own maintenance organizations to repair and maintain their training aircraft. In contrast to the squadron organization, most of the personnel at a school "engineering department" were civilians, but like the squadron depots these did not serve as general repair depots for frontline aircraft. Major overhauls were still viewed as a matter for the aircraft or engine manufacturer.

"Happy" Bagnell and Maintenance at Kelly Field

Thus, there were few precedents to guide Lieutenant Bagnell as he took charge of Kelly's emergent engineering department. His racing experience, and knowledge of auto engines, was undoubtedly an important consideration in his selection for the position, but no one had yet dealt with the problems associated with running a maintenance organization amid the pace of expansion now underway.

Located on Kelly Number 1 until October, Bagnell's maintenance effort was hampered during the first few months by the acute shortage of trained mechanics. Although the Air Service made strenuous efforts to attract skilled men from aircraft manufacturers and identify recruits with a background or aptitude for such work, it was not until August that enough men could be found to create a permanent maintenance squadron. Initially numbered the 110th Aero Squadron, this squadron was renumbered as the 804th Aero Squadron in February 1918 and was eventually designated as Squadron K.

During the first few months it was difficult for the ill-equipped mechanics to keep even the few available aircraft in flyable condition. For a time the field had only ten aircraft, and all were in various stages of reconstruction after training accidents. In the midst of this, Bagnell organized and carried out the abrupt transfer of his organization to Kelly Number 2 in October 1917. Given no advance warning and less than a single day to make the move, Bagnell commandeered every truck at the field and shifted every item of equipment and all his supplies (including coal) by mid-afternoon. Even as the last loads of material came off the trucks, his mechanics were back at work repairing and overhauling engines.

Within days, Bagnell was confronted with the need to construct 100 brand-new trainers--a task he accomplished only by impressing literally every enlisted man on the field into service. Episodes such as this made "Happy" Bagnell something of a celebrity; a status he added to when he unilaterally purchased several railcars of spruce lumber and a carload of steel. As it turned out, both acquisitions proved wise, but this did not stop him from facing potential court-martial charges for "injudicious expenditure" of Signal Corps funds. When no charges were actually brought, Bagnell's local reputation grew further.

Bagnell's opportunities for such individualism disappeared when the Air Service reorganized the engineering department in November 1917 and placed Major J. E. Rossell in charge. No longer the engineering officer, Bagnell took charge of the woodworking department, machine shop, welding and brazing departments, tin shop, magneto overhaul department, the vulcanizing department, and the stock and tool room. At the same time, he became head of the Field and Hangar Division, with the responsibility of overseeing the daily maintenance of the training aircraft in use. When Rossell left to take charge of flying at Gerstner Field, Louisiana, Bagnell became the engineer department inspector with two new officers sharing his former responsibilities. Major Hubert H. Harmon succeeded Rossell briefly before being assigned to Taliaferro Field. He was replaced as Kelly's engineer officer by Major L. H. Drennan, who was in turn succeeded by Major S. M. Decker in March 1918. In June, Lieutenant Bernard Cane, a one-time automotive engineer who had assisted Bagnell in obtaining the railcar of steel, took over as engineer officer until the end of the war.

Lieutenant Edgar Bagnell got into hot water by "appropriating" a railcar of steel for his maintenance operation.

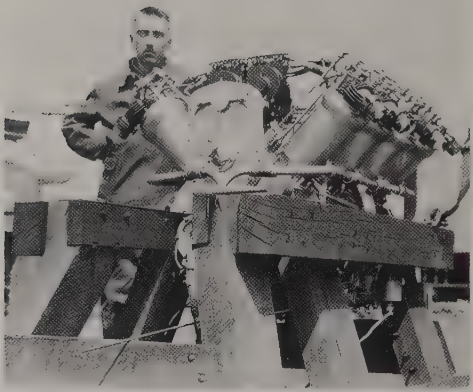
Propellers were a critical item during the early days.

Organization of the Engineering Department in 1918

By the time Bagnell, still a lieutenant, left Kelly in the summer of 1918 (disappearing into history), over 1,900 men were assigned to the Engineering Department. Although Aviation Section Training Manual Number 2 in 1917 established a three-tiered system of maintenance, with major repair and overhaul supposedly handled at general repair depots, only a handful of these depots existed, and Kelly's shops were forced by necessity to undertake these tasks. To some extent, this situation was accepted by the Air Service when, for the first time, it spelled out the duties of the engineering officer at a training field in February 1918.

Bulletin 952 from the Information Section of the Air Division, issued on February 11, 1918, specified that the engineering officer at a flying school was responsible for routine maintenance of hangars and aircraft, the care of the airfield itself, maintenance of all post buildings and facilities, supervision of all motor vehicles (including fire trucks), and the activities of all the repair shops. These shops ran the spectrum of repair activities, including engine repair and testing, welding and brazing, painting and dope application, woodworking, fabric application, and vulcanizing. To carry out this wide variety of responsibilities, which made him, in effect, the local transportation and facilities officer as well as the maintenance chief, the engineering officer had five subordinate officers to oversee each subdivision. By contrast, although his duties were similar, the engineering officer at a depot did not have to worry about the condition of the flying field or routine maintenance of aircraft in service.

Of the five areas of responsibility spelled out in early 1918, that encompassing the shops was the most diverse. At Kelly the shops were organized into five divisions: the Motor Repair Division, the Airplane Division, the Woodworking Department, the Field and Hangar Division, and the Testing and Inspection Stage. Kelly Field was unique in having a separate Woodworking Department; other fields incorporated this branch within the Airplane Division.



The Curtiss OX-5 engine of the "Jenny" was the main work load for Kelly's engine shops in World War I.

Woodworking was, in fact, a crucial element in aircraft maintenance. All major aircraft framing was of wood in 1918, making this department responsible for construction (or, in many cases reconstruction) of the parts that made up the basic aircraft fuselage. Under Lieutenant Bagnell and Lieutenant Paul N. Edwards, the Woodworking Department pioneered the use of jigs to simplify the production of ribs, spars, and other necessary parts in quantity--in many cases eliminating the need to purchase such parts from aircraft manufacturers. The Woodworking Department also had to maintain and produce propellers--a highly demanding craft, especially in the high heat of a south Texas summer. The 1st Aero Squadron had trouble with propellers literally disintegrating during 1916 as a result of the glue holding the laminations drying out. For a time the Air Service resorted to storing propellers in large humidors between flights. By 1918, however, Kelly's mechanics had developed a poplar propeller which became known as the "Kelly Field Propeller," none of which ever gave way.

The parts produced by the Woodworking Department went to the Airplane Division for assembly. Initially called the Experimental and Repair Division, the Airplane Division repaired and built fuselage and wing frames, repaired flight instruments, put the fabric on wings and fuselages, completed final assembly of aircraft, and supervised the collection of damaged aircraft by the "Wrecking Crew." The construction of a new aircraft took about 230 hours by the summer of 1918, and the Airplane Division could (and did) assemble entire JN-4 aircraft using only parts salvaged or constructed at the field.

Early aircraft mechanics had to be skilled woodworkers.

Aircraft Maintenance in 1917

An aircraft of 1917 was a curious combination of both new and old technology. Much of their structure was wooden. Men skilled in carpentry thus formed a crucial part of the maintenance team.

Wing installation and repair is one illustration of this. Wing ribs were cut from spruce to match a pattern. Variations between the new rib and the pattern had to be corrected by hand. The various pieces of the wing were assembled with glue, grommets, and small nails, after which the ribs could be fitted between the larger pieces which formed the trailing and leading wing edges. The whole assembly was held together with wire braces, adjusted with turnbuckles. Tension on the wires had to be almost perfect. Too much, and the stress would snap the wing; too little, and the wing would not support the aircraft in flight. Adjusting the wires so the wing was straight was known as "tuning."

Wing surfaces were cloth. Mercanized cotton was sewn into a tube or sock, then turned inside out so the seams were inside. This tube was pulled over the frame of a wing and the final seam sewed along the edge nearest the fuselage. The cotton fabric was sprayed with water and allowed to dry, shrinking tight against the wooden frame. Once dry, the wing was painted with six coats of clear acetone dope to make it hard, and a seventh coat with pigment for color. Ailerons were built separately in a process identical to the wing, and then attached. In the photos, mechanics are assembling frames which belong to a Curtiss R-4 (an early trainer).

Aligning a Fuselage

Fuselage construction was basically the same. Alignment of the fuselage frame was critical, though, if only to avoid having an aircraft that was difficult to control in the air. Alignment was attained and kept with wire braces, again held with turnbuckles. Difficult to do accurately by eye, fuselage alignment was eased by the development of a jig. The fuselage was suspended above the jig, and plumb bobs hung from key points to markers on the jig. One mechanic would crawl inside the fuselage and adjust the turnbuckles until colleagues outside indicated that the plumb bobs matched the jig markers.

The San Antonio Supply Depot

Paralleling the development of institutionalized Air Service maintenance was the growth of aviation supply. In 1914, the Signal Corps established a small supply depot at Fort Sam Houston under the command of Captain J. C. Minus. By 1917, this depot, now commanded by Lieutenant J. C. Tips, occupied a warehouse at 1903 South Flores Street in San Antonio, with its administrative office on the second floor of the Tips Hardware Store on Commerce Street. Tips supervised a pair of officers, a handful of enlisted men, and between eight and ten civilian employees who handled some $4000 worth of Army materiel.

The rapid expansion of Kelly Field during 1917 placed great strains on the depot, in part because of the five to seven miles between it and the field. As a temporary expedient, the depot used a hangar on the field as a warehouse. At the same time, the proliferation of flying fields around the country led the Air Service to decentralize supply operations through the creation of a number of large general supply depots at locations from which they could serve a number of different fields. Since planners expected to build a number of fields in the San Antonio area, Kelly Field became a natural choice for one of these depots. In October 1917, construction began on a large wooden warehouse, designed in a U-shape to allow railcars to be unloaded directly into storage.

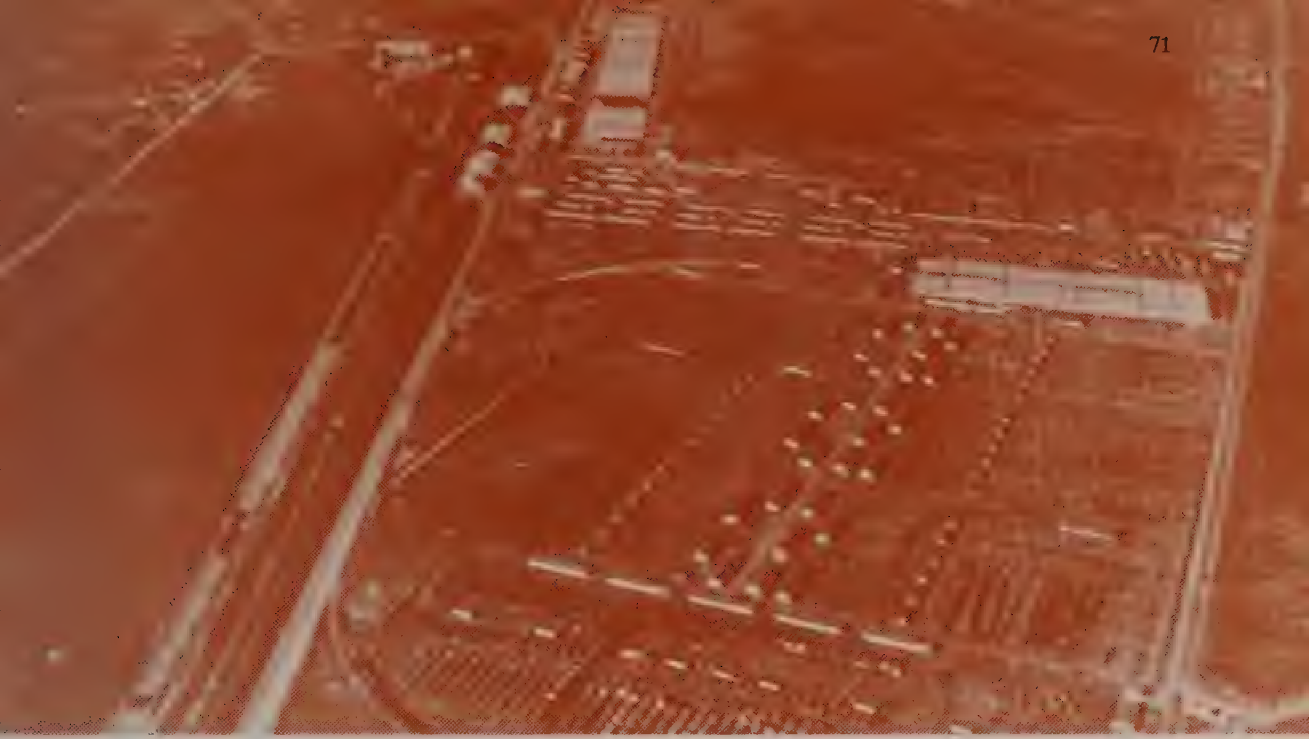
The new warehouse was not ready for use until June 1918. In the meantime, the enormous growth in the depot's work load led the Air Service to assign the 337th Aero Squadron (renumbered as the 675th) to the depot in January 1918 and the 326th Aero Squadron (renumbered as the 662nd) in May. The unknown author of the 675th squadron's section of the 1919 Kelly Field yearbook recalled that the selection process for enlisted men differed from that used for all the other squadrons formed to that time. Each man taken into the 675th was personally interviewed by Lieutenant John Dewey and Lieutenant William P. Bates, the squadron commander and his executive officer. For a time the squadron bunked in the temporary warehouse used by the depot, but the men soon found themselves forced to move into tents pitched nearby until barracks were ready. Admitting

"Miss Kelly Field"

In December 1917, the small Signal Corps aviation supply depot became the nucleus of a much larger organization, the Aviation General Supply Depot. The first warehouses at Kelly had not been completed when civilian workers were asked to volunteer to work "in the wilderness." Stella Davis, a stenographer and typist for the supply depot, was the only woman to volunteer.

Conditions were primitive at first. There were no bus routes to the field in 1917-1918, so the Army sent a special car to take her to work and bring her home again. During cold weather, Mrs. Davis wrapped a blanket around herself for warmth during the bumpy ride. To keep warm, she carried a small coal oil stove with her wherever she worked.

Stella Davis retired in September 1945. When asked why she volunteered to work "in the wilderness" in 1917 without the usual office amenities, Kelly's first woman employee stated that her country was at war and needed her help--sentiments echoed by thousands of other women who have followed in her footsteps to serve their country at Kelly.



Kelly Number 1 at the end of World War I. The large depot warehouse is in the right center. The spur from the Missouri-Pacific tracks is clearly visible. The buildings running diagonally from the warehouse toward the middle foreground are mess halls and office buildings of the 1st Training Brigade, whose tents covered the empty ground during the war.

that the squadron "had it very easy for a spell," the surge of material arriving for either storage or redistribution forced the employment of even the administrative staff as physical laborers.

The 662nd Aero Squadron arrived by a more circuitous route. Formed in December 1917, the squadron spent several weeks in the 2nd Training Brigade before moving to Kelly Number 2 (and spending three damp nights housed in tent hangars). There they worked on aircraft and motors as part of the Engineering Department. Scheduled to embark with three other squadrons for France in May, the 662nd was abruptly ordered to report to the supply depot. Upon arrival, recorded the anonymous author of their section of the 1919 yearbook, they simply "pitched our tents on any vacant spot we could find next to the warehouse" and went to work.

By the end of World War I, the 300 enlisted men and fifty civilians of the San Antonio Aviation General Supply Depot were unloading or loading between 200 and 300 railcars each month. By this time Lieutenant Tips was gone, replaced by Captain Samuel Anable in April 1918. Anable was, in turn, succeeded by Lieutenant Colonel William F. Pearson, who took over in August 1918 and was still commanding the depot when the war ended.

Post-War Consolidation

Although the end of World War I brought rapid demobilization and the discharge of the enlisted men of the depot, it did not bring a complete halt to depot operations. Pearson left for duty with the Division of Military Aeronautics in December and was succeeded by Major George H. Brett. Brett was in place for only two months before Major William H. Garrison arrived to succeed him in February 1919. The following month the last enlisted personnel left and the depot went on civilian status.

One of Garrison's major concerns was the lack of quarters for the eight or nine other officers at the depot, but it was not until early 1920 that he obtained permission to use local labor and salvaged material to construct officers' quarters. By 1922, nine bungalow-style buildings were up along present-day Robins Drive to the immediate east of the main depot building, forming the core of what would become Kelly's "Bungalow Colony." Built mainly of salvaged pine lumber, the quarters were viewed as among the finest in the area. Inspiring much envy, the houses had the advantage of being heated from a central steam plant, eliminating for the residents the tiresome and dirty chore of stoking a coal-fired furnace. Nearly fifty years later, Garrison's "Bungalow Colony" would still be the quarters of the senior officers of Kelly, forming a small oasis of picturesque charm amid the machinery and bustle of a modern logistics center.

During Garrison's tenure as depot commander, the Air Service also followed through on a program of consolidating the supply and repair depots which had proliferated nationwide during the war. As part of this policy, in March 1921, the Aviation Repair Depot at Love Field, Texas, was moved to Kelly and joined to the existing supply depot to form the San Antonio Air Intermediate Depot. The relocation of the Air Service Mechanics School to Chanute Field meant that ample repair facilities existed for the new depot (one of only three in the country) which held responsibility for maintenance and repair of all Army aircraft in the large Eighth Corps Area encompassing most of the United States between the Mississippi and the West Coast. During the next few years, the personnel of the depot would demonstrate their skills by preparing Lieutenant Jimmy Doolittle's DH-4 for his coast-to-coast dash in 1922, tuning up the aircraft of the Pan American Goodwill Flight, and ensuring the regular repair of the hard-used trainers of the Advanced Flying School at the north end of the field.

The Creation of Duncan Field

At the beginning of 1925, Kelly Field was home to both the Advanced Flying School and the San Antonio Air Intermediate Depot, divergent functions which complicated local administration. Although it would be another year before the combination of the reports of the Lassiter and Morrow Boards, lobbying by Air Service leaders, and Congressional investigation would result in the passage of the Air Corps Act of 1926; the Air Service was already concerned with the need to develop an organization which would separate flying and support activities. Thus, in March 1925, Kelly Number 1, the site of the depot, was renamed Duncan Field, formally separating the activities of the depot from those of the flyers on Kelly Number 2--which retained the designation Kelly Field. Creation of the Air Corps Materiel Division a year later (as part of the reorganization called for by the Air Corps Act) merely confirmed the emergent command structure of the Army's air arm.

Major William Garrison, first commander of the San Antonio Air Intermediate Depot and later founder of the USAA Insurance Company.

The houses in the Duncan Field "Bungalow Colony" are still used as homes for Kelly's senior military officers. The white building in the center of the photograph was the headquarters of the Air Corps Training Center. Today it is the headquarters of Kelly's Security Police Squadron.

Off to a Muddy Start

The cold rain that fell on Kelly Field this particular February afternoon in 1921 turned the normally parched South Texas soil into a quagmire of mud. A small group of men waded through the muck unloading railroad cars that had traveled 300 miles south from the Aviation Repair Depot at Love Field in Dallas.

The men from Love Field viewed their new "home" with some dismay. The scene revealed rough cut wooden buildings, mud, a huge U-shaped warehouse, tin corrugated iron hangars, and more mud. Captain Edward Laughlin, repair depot commander, chose a tiny office attached to one of the hangars to hold his first meeting. It was the only one with a concrete floor. After the rains abated, one of the first jobs the new arrivals tackled was covering the dirt floors in the rest of their buildings with a thick layer of concrete.

The move from Love Field was completed in March. Out of habit, the last man to leave the old Dallas depot locked the door. Since he had no further use for the key, he threw it away. It's doubtful that the men who slogged through the mud in 1921 realized they were laying the ground work for the logistical giant that exists today. However, the spirit and dedication demonstrated seven decades ago remains as part of the Kelly tradition.

Depot Activities in the 1920s and 1930s

In 1927, the depot's designation changed, and it became, simply, the San Antonio Air Depot. For a few years, too, Duncan Field was the home of the Headquarters of the Air Corps Training Center, which moved to brand-new Randolph Field in 1930. Aside from such minor shifts, the activities of the depot remained very much the same for the next fourteen years.

In 1926, depot commander Major Frank Lackland offered a summary of its activities and responsibilities in the "Army and Navy Courier." Including the commander, there were only ten officers assigned to the depot from the Air Corps, a single officer of the Quartermaster Corps, and three warrant officers. All other depot personnel were civilians--453 of them in 1926 and still less than a 1,000 by 1938. Their skills ran the gamut. There were blacksmiths, cabinetmakers, carpenters, electricians, chauffeurs, machinists, plumbers, mechanics, molders, crane operators, painters, riggers, fabric workers, and general repairmen, as well as messengers, stenographers, and repairmen. They handled every class of

Military members of the Aviation Repair Depot which moved to Kelly from Dallas in 1921. Captain Edward Laughlin, Chief Engineering Officer, is third from left.

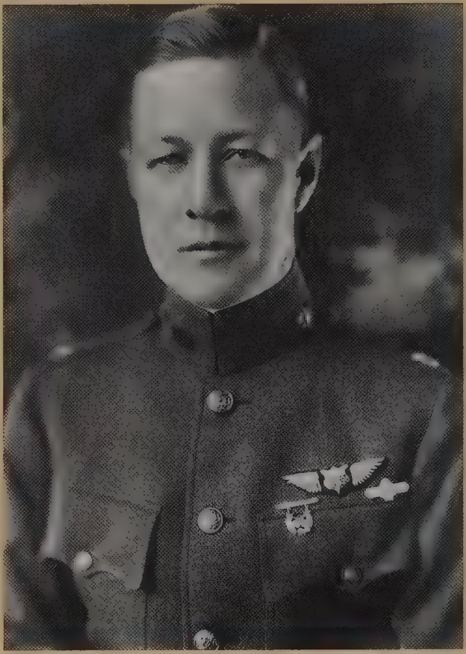
Air Corps equipment from cotter pins to complete aircraft, storing literally hundreds of wings, propellers, and engine parts in their warehouses and repair shops. According to Major Lackland, at least a third of the Army's aircraft were located within the Eighth Corps Area, and up to fifty percent of Army flying took place in the same area--6,000 hours a month just at the nearby flying schools. In 1925, the depot overhauled and repaired 452 aircraft and 865 engines. A decade later, the depot managed to overhaul 287 aircraft and 650 engines, while doing minor repair or service to a further 329 aircraft and 320 engines.

The two main components of the depot were the Depot Supply Department and the Engineering Department. There was also a Station Supply Department which monitored the supplies within the Engineering Department; a Station Accounting Department; an Inspection Department; and a Flying Department. As its name suggests, the Flying Department supervised the test flights of repaired and rebuilt aircraft, piloted by all the rated personnel assigned to the depot in addition to their other duties. In 1925, this involved a total of over 8,400 flights and 21,000 flying hours.

By and large, the organization of the depot remained unchanged into the late 1930s. The only major addition was the activation of the 3rd Transportation Squadron in 1936, to ferry freight and personnel within the Air Corps Materiel Division. The squadron formed a part of the 10th Transport Group, headquartered at Wright Field, Ohio, and its aircraft were held by them via a memorandum receipt from the depot. Initially, the squadron consisted of a single officer and fifty-four enlisted men. Three more officers joined by 1938, and in 1939 ten reserve officers went on extended active duty with the squadron.

Duncan Field Facilities

For much of the 1920s, the depot utilized the hangars and warehouses constructed during World War I. Demobilization left a large number of wooden barracks, along with associated mess halls, offices, and other structures, that were steadily torn down through the early years of the decade. Some of the material from these ended up in the "Bungalow



Major Thomas Duncan

Major Thomas Duncan graduated from the United States Military Academy at West Point and received his commission as a second lieutenant in the Coast Artillery in 1905. After service at various installations around the United States and the Philippines, he transferred to the Signal Corps in 1917 for service in the Aviation Section. He arrived at Kelly Field on November 23, 1917, and served as Kelly's Executive Officer, Summary Court Officer, Survey Officer, and Inspector, while learning to fly in his "spare" time.

In June 1918, Major Duncan assumed command of Wilbur Wright Field in Fairfield, Ohio. After World War I, he worked in the office of the Chief of the Air Service in Washington, D.C., and at the Militia Bureau, the equivalent of today's National Guard. On May 23, 1923, while on a practice flight at Bolling Field in Washington, Major Duncan's aircraft crashed at the south end of the field, killing him and his passenger, a War Department civilian. Subsequently, Major Duncan was described as the most popular and admired officer in the Air Service.

On March 13, 1925, the name of Kelly Number 1 was changed to Duncan Field. Remarking upon the name change, Major Frank Lackland, a good friend of Duncan's and Commander of the San Antonio Air Intermediate Depot (and Duncan Field) at the time, said, "Probably no one officer in the Air Service was so well known to and beloved by officers and enlisted men."

Colony" of officers' quarters built between 1921 and 1927, but much of it was simply discarded.

For most maintenance activities in the first decade following World War I, the depot made use of the original tin-roofed, iron-framed hangars erected by Koerner in 1917. Of the original twelve, only five remained in existence by 1937, with one serving as a combination warehouse and post exchange and two others remodeled into a barracks and mess hall for the men of the transport squadron. By 1938, they, too, were replaced by purpose built structures, and the remaining hangars served primarily as storage areas for maintenance supplies and equipment.

Immediately south of the 1917 Koerner hangars was an engine test building. Although open-air test stands existed in this area during World War I, these were replaced with a new test building in 1936, supplemented by test stands erected between the Koerner hangars. During 1939 the depot commander, Lieutenant Colonel Henry J. F. Miller, gave top priority to the construction of a larger set of four engine test cells in the same area. Although Air Corps expansion during the last years of the decade gave added urgency to his requests for additional engine test space, construction of these new engine test cells was not underway until 1941. They filled a long, narrow rectangle parallel to the railroad tracks south of the original line of Koerner hangars and just to the west of the 1936 engine test building and were turned over to the depot in October.

In 1933, engineering and maintenance operations largely relocated to a large, concrete-and-steel hangar built by the A. J. Rife Construction Company of Dallas. Measuring 448 feet by 560 feet, this hangar (still a dominant structure in Kelly's maintenance area), dramatically increased the shop space available to the depot.

Among other important structures during the 1930s were a pair of hangars to the north of the engineering shops. Built in 1932, these two hangars were the home of the test division. Their checkerboard roofs show up clearly on aerial photographs from the 1930s, and both are still in use. Long known as Test Flight Hangars Number 1 and Number 2, they are still marked with those numbers, convincing many people that they are the first two hangars at the field.

Another pair of hangars stood across the field to the southwest for the use of the transport squadron. A smaller, hangar-like structure nearby housed field operations, while between the two hangars a small, two-story, wooden building served transient aircraft crews.

Warehouses of the Depot Supply Department were filled with ordered bins of literally hundreds of parts.

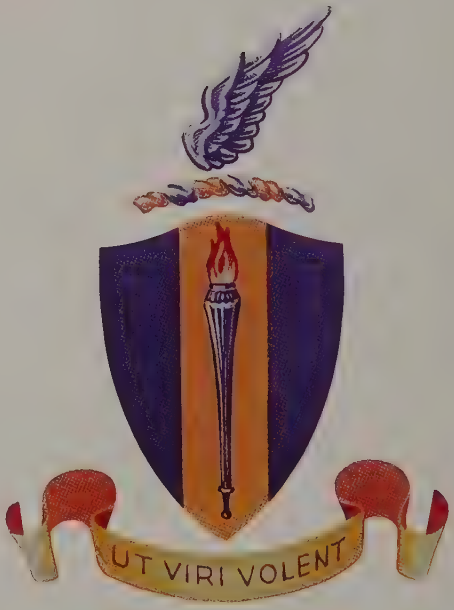
To the east of the test flight hangars sat the warehouses of the supply division. The largest of these was the 1918 depot supply warehouse, measuring 830 feet by 270 feet, and built so that the rail line ran directly into a U-shaped central area. Large as it was, this warehouse was insufficient by the 1930s and had been supplemented by six smaller structures built on either side of the railroad tracks to the south. All were built of wood and viewed as temporary, but nothing better was available as Air Corps expansion got underway at the end of the decade. Inspectors reported that "millions of dollars of government property is constantly exposed to fire hazard and deterioration because of inadequate storage facilities;" but Colonel Miller still had to struggle to gain authority to build another warehouse. The initial plan of the new building, featuring a U-shaped opening to accommodate a rail line, echoed that of the 1918 structure. In late 1939, however, this plan

The appearance of the Boeing P-26 in 1933 marked the beginning of the end for fabric-covered, biplanes.

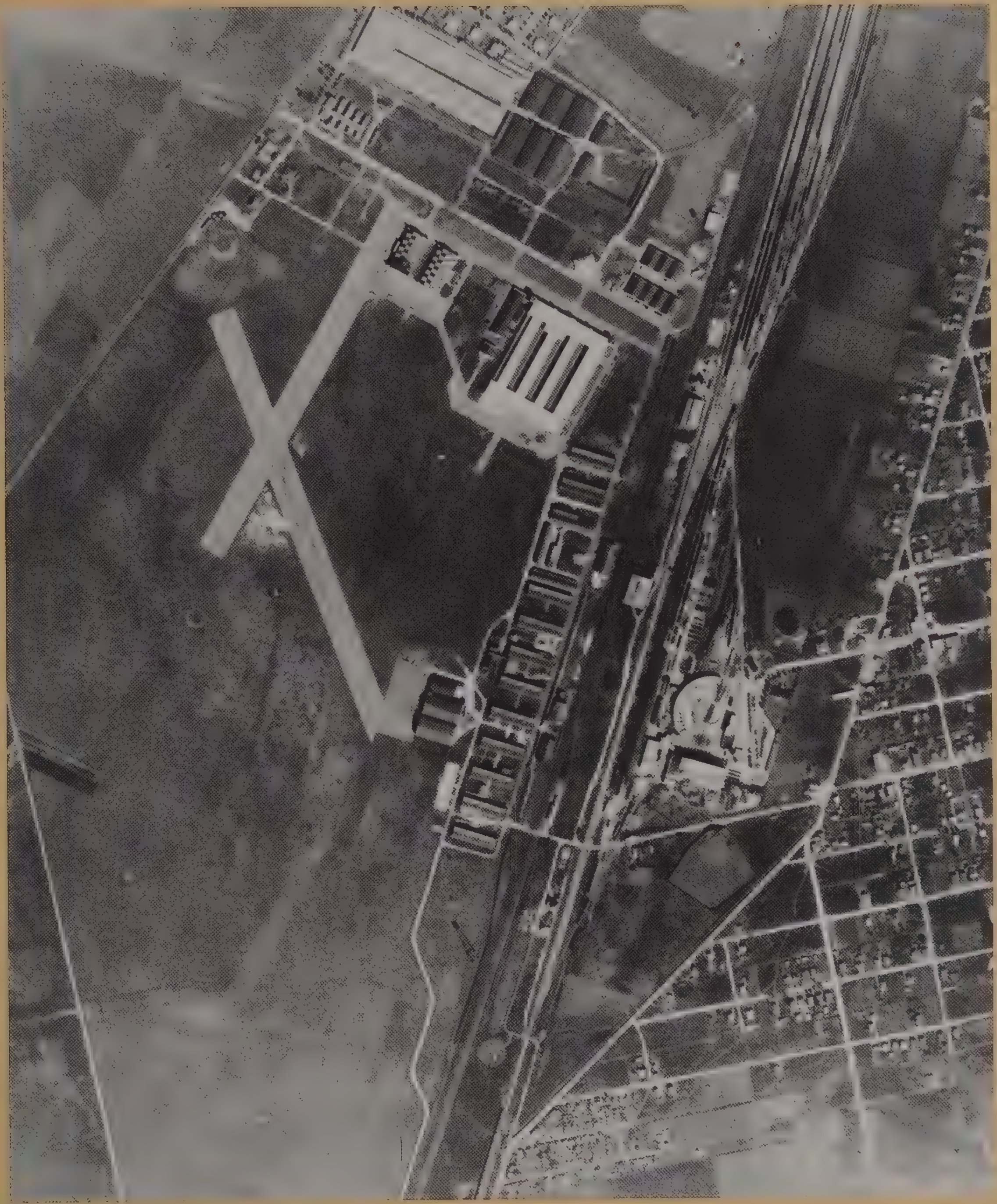
was dropped in favor of one for a smaller, single-story structure without an internal railroad bay. By the time this new warehouse was accepted in September 1941, it was already inadequate, and plans existed for an addition. In any event, the addition was not completed until the spring of 1942, by which time storage space at Duncan Field was desperately short.

Last Years of Peace

Until expansion began to fundamentally change depot operations at the very end of the 1930s, the pace of life had been predictable and the work force small and self-contained. Turnover was small; good jobs were hard to find in the Depression. Weekend hunting and fishing trips brought civilians and officers together, and most of the civilian employees knew each other and their families. Even as the pressure of Air Corps growth began to transform Duncan Field in 1940 and 1941, few, if any, of the men and women of the depot would predict that within a few, short years a twenty-fold expansion would completely alter both the depot and its relationship with the flying field to the north. Everything was about to change.



Distinctive insignia of the Advanced Flying School with its motto "That Men May Fly."



Duncan Field in 1935. The checkerboard roofs of the transient aircraft hangars are clearly visible to the north of the large repair hangar. At this point, Koerner's steel-and-concrete hangars along the railroad tracks were still in use.

Chapter Four

Global War:

Reorganization and Restructuring During World War II

By the end of the 1930s, it was clear to American leaders that the aggressive expansionism of Nazi Germany and Imperial Japan would soon bring on a war which inevitably would threaten American security. By the outbreak of war in Europe in 1939, the United States was slowly but surely moving away from the isolationism that dominated the 1920s and 1930s and preparing to face challenges which dwarfed those faced a generation before. The progress of American preparedness was not entirely smooth. There was widespread debate both within and without the government about the proper policies to follow. But amid the rhetoric and debate, two facts were crystal clear: whatever military policies the United States adopted, airpower would be a fundamental part of effective military strength, and the effective development of American airpower would demand unparalled expansion.

Pilot Training Programs

Air Corps expansion began with President Franklin Delano Roosevelt's message to Congress in January 1939 asking for $300 million for "defensive aviation." Over the next two years, as aircraft manufacturers began to produce designs and tool-up factories for production, planners consistently increased estimated personnel needs. Initial plans called for the creation of twenty-four flying groups by June 1941, but in May 1940 planners revised the program upward to a total of forty-one groups Only two months later the total was again revised, to fifty-four groups, and by the fall of 1941 the Air Corps--now the Army Air Forces--planned to have a total of eighty-four groups by the end of June 1942. By December 7, 1941, seventy of these groups existed, although most were still only cadres and few possessed appropriate aircraft.

The struggle to produce increased numbers of modern aircraft was undoubtedly the story most closely followed by the public. But of even more importance was the effort to provide trained pilots, aircrew, and mechanics for the growing force. Between July 1939 and July 1941, Air Corps strength leaped from around 20,500 officers and men to over 152,000--a total which was still increasing rapidly at the time of Pearl Harbor. The initial goals set in 1939 demanded the training of 1,200 pilots per year, a level which jumped to 7,000 per year within a few months and grew dramatically with each new expansion program. By the fall of 1941, as planners debated the eighty-four group program, the Army Air Forces predicted a need for upwards of 50,000 pilots per year by mid-1942.

General Henry H. "Hap" Arnold oversaw the expansion of the Air Corps into the Army Air Forces of World War II.

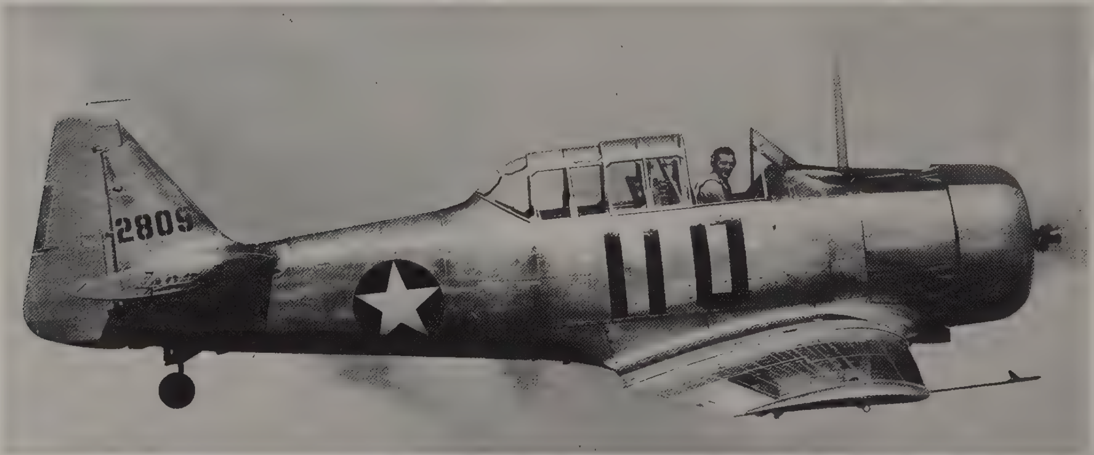
RANDOLPH FIELD
SOUTHEAST CORNER

Headquarters of the Gulf Coast Training Center was at Randolph Field--later the home of the Air Training Command.

Even the earliest of the pilot training goals was beyond the capacity of the existing training fields. Thus, during the years from 1939 to 1941, the Air Corps began using civilian training schools for primary flight training. The first nine of these civilian primary schools began operating in May 1939, with more added steadily during the next two years. By December 1941, the total number was forty-one, and it peaked at fifty-three in 1943. By that time all primary flight training was being handled under contract to these schools. At first, Randolph Field was viewed as capable of handling the basic training of the cadets coming from the civilian primary schools, with Kelly and Brooks Fields carrying out advanced training. But when the fall of France in the spring of 1940 brought forth the 7,000 pilot program, the situation changed. The Air Corps Training and Operations Division in Washington, D. C. promptly reorganized the training structure, creating two new training centers. A center at Maxwell Field, Alabama, (the Southeast Training Center) took responsibility for all training east of the 92nd meridian, and a center at Moffett Field, California (the West Coast Training Center), took control over training west of the 108th meridian. The former Air Corps Training Center at Randolph Field became the Gulf Coast Training Center, with responsibility for the rest of the country. Each training center was to supervise the creation of a series of new basic and advanced training fields, gunnery stations, and other specialized training centers. As a result, Kelly Field lost its former status as the nation's single advanced flying school, even though it remained a key center of flying training.

Changes in Flying Training

Prior to 1939, cadets received advanced training in one of four specialties--pursuit, bombardment, attack, or observation. This specialization ended in June 1939, and for a time all cadets theoretically received the same course of instruction. Course time was shortened, too. Beginning with Class 40-A, which entered training in December 1939, the advanced course was cut from four to three months to allow more classes per year. The advent of the 7,000 pilot program forced a further cut in the length of the



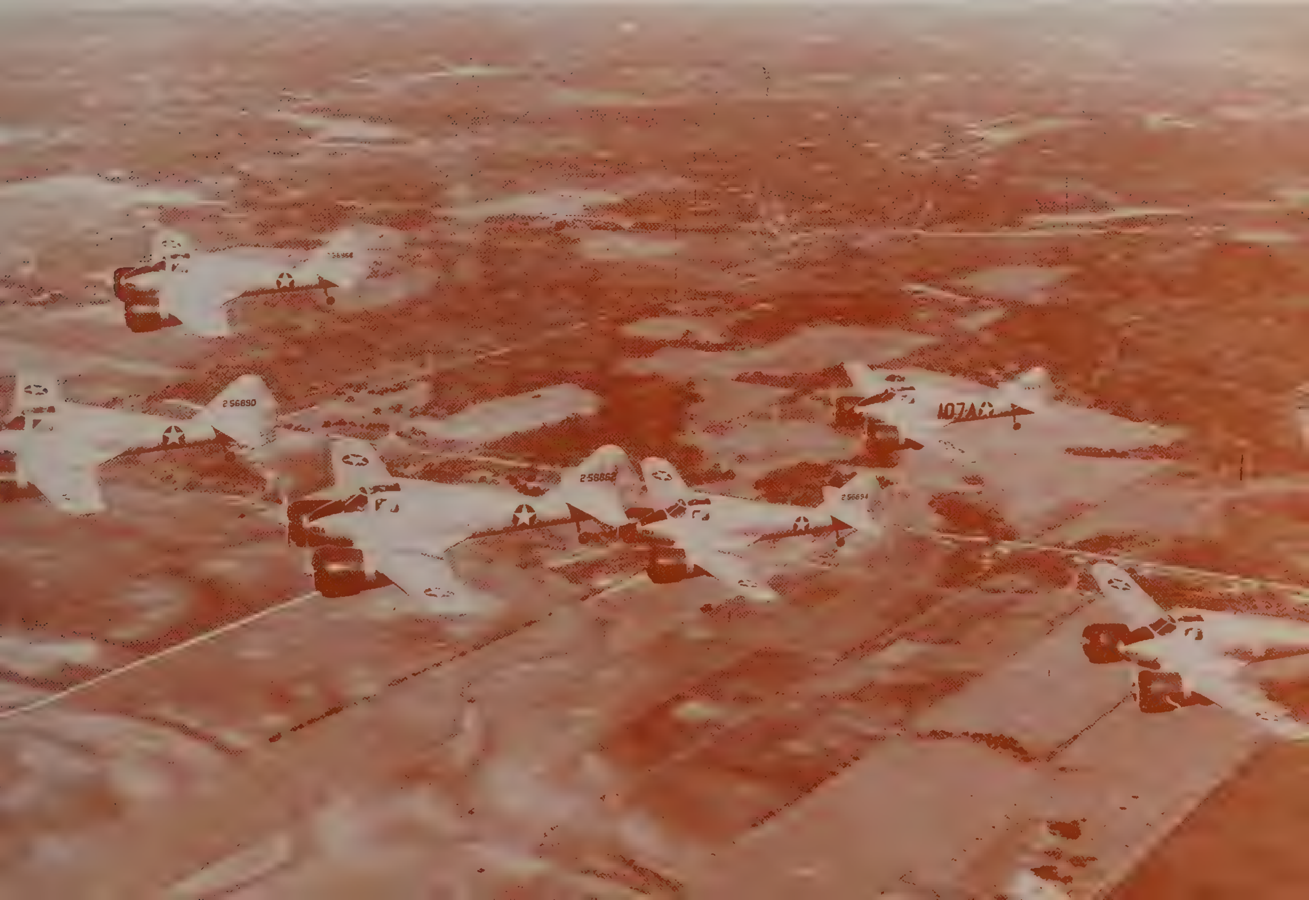
The AT-6 "Texan" (called the "Harvard" by the British) was the dominant advanced trainer of World War II.

advanced course to ten weeks, a time period retained when the 12,000 pilot program emerged. By September 1940, basic and primary training were limited to nine weeks each, and advanced schools were designated as either single or twin-engine schools. Under this program Kelly became a twin-engine advanced school. Air Corps plans to double the rate of aircrew training in 1941 to meet the demands of the eighty-four group program forced a further limitation on the time spent in advanced training. All phases of flying training became nine weeks long with training conducted seven days a week. By 1941, training was concentrated into just over six months.

War Comes to Kelly

Pearl Harbor, and the entry of the United States into World War II, brought plans for the annual production of 70,000 pilots, but it did not substantially alter the curriculum by then in place. The pace of training increased dramatically, but the pattern of instruction remained fairly consistent throughout the war. The instructor explained, then demonstrated, each maneuver. After this, the student-pilot attempted the manuever, and the instructor offered verbal correction and explanation of any errors. As far as possible, a student retained the same instructor throughout a phase of training, allowing development of a rapport between teacher and student that facilitated instruction. In most ways, this process followed the "all through" or Gosport system, pioneered during World War I. Although the Army Air Forces experimented with a different approach in 1943, with students progressing through stages at their own pace with different instructors at each stage, scheduling difficulties and the demand placed on instructors persuaded trainers to return to the standard system. The bond between student and teacher may have been an intangible aspect of training, but it was clearly vital.

Before the arrival of these AT-9 trainers, pilots destined for multi-engine duty were forced to train in single-engine aircraft.



Kelly Aircraft, 1938-1943

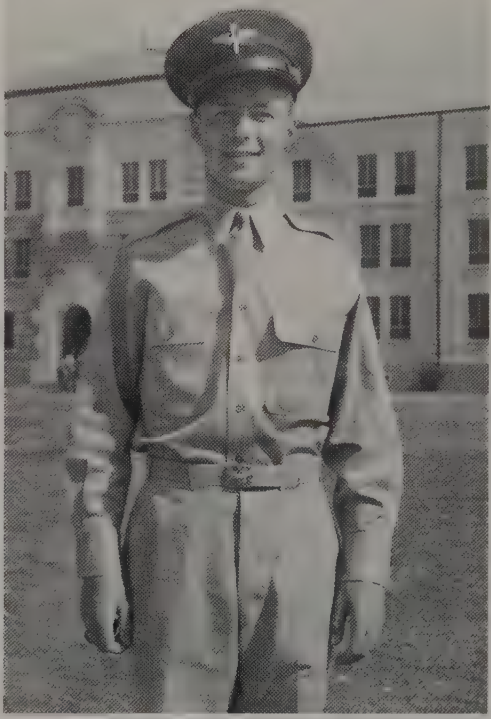
Training aircraft were at a premium during the first years of the war. In too many cases, schools relied on antiquated or inadequate equipment, a situation which was not entirely new. A 1937 Inspector General's report bluntly stated that Kelly Field's aircraft were "largely made up of the oldest and most out of date airplanes in the Air Corps," and urged that no further bombardment training take place at the field.

Colonel Arnold N. Krogstad, the Commandant of the Advanced Flying School, protested that graduates from the school were joining tactical units three times a year, with no complaints about their skill or ability to fly bombers--or any other type of aircraft. Krogstad admitted that some of Kelly's aircraft were "obsolete," but argued that the situation was improving as new, more modern types arrived. However, as Air Corps expansion got underway in 1938, Kelly's aircraft inventory still included large numbers of obsolete and obsolescent planes. Among these were thirteen P-12 and nineteen BT-8 trainers for pursuit pilots, fourteen O-25 and two O-38 observation aircraft, and twenty-four A-17 attack planes. Bombardment students were forced to train in a handful of B-7, B-4, and B-18 aircraft, with only the B-18s resembling the more modern bombers in development. With only three B-18s assigned, the advanced school was forced to have some students fly only as copilots on many training flights. As a temporary expedient, the field borrowed a B-18 from Randolph Field and obtained four C-40 aircraft. These were hardly bombardment aircraft, but they at least gave some students an opportunity to fly a more modern, multi-engine plane.

In late 1939, BC-1 trainers began to arrive at the field, with small numbers of AT-6 "Texans" supplementing them in the spring of 1940. By May, the school had some fifty-two AT-6s and needed seventy-three more. The opening of additional training schools was a persistent drain on Kelly's aircraft inventory since the field had to send many of its aircraft to the new schools. At least officially, Kelly was a twin-engine school, and both the BC-1 and the AT-6 were single engine aircraft. Unfortunately, nothing else was available. For nearly a year, future pilots received their advanced training on the "Texan." Not until September 1942 did Beech AT-10 and Curtiss AT-9 twin-engine trainers arrive at Kelly in suitable numbers. Neither was a truly satisfactory substitute for the frontline aircraft in use (no really good twin-engine trainer appeared until modified B-25s were available in 1944), and the first class which could make use of them, Class 42-K, was, ironically, the last flying training class at Kelly.

Student Flow

Shortening the length of the advanced course was one way to increase the production of pilots; another was the simultaneous instruction of classes. By June 1939, new classes entered every six weeks, with two classes in training at the same time. By May 1940, a new class arrived every five weeks, allowing nine



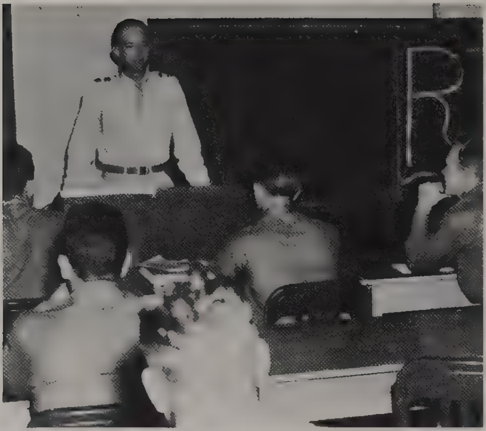
John Phillips graduated with Class 42-I in October 1942. By this time cadet blue was replaced by Army olive, and cadets were titled "Aviation Cadets" rather than "Flying Cadets.

classes to graduate per year. Reducing the course to nine weeks allowed eleven classes to complete training during 1942, a pace that put enormous strain on overworked instructors and forced maximum use of whatever training aircraft were available. Nevertheless, from Class 38-A (which actually entered advanced training in October 1937) through Class 42-K, 7,123 candidates began advanced training at Kelly, with 6,845 graduating. These numbers become even more impressive when added to those of previous years. By the time flying training ended at Kelly in 1943, 9,616 Army pilots had won their wings at the field since 1922. Even as it became only one of many sources for the pilots of the American air armadas of World War II, Kelly remained a vital part of the training scheme.

The experiences of the men who passed through the field during the last few years of training largely echoed those of earlier years. The pace of training may have been faster; but in their eagerness and enthusiasm, most did not really notice. Philip Ardery came to Kelly's advanced school in early 1941 after primary training in Nebraska and basic flight training at Randolph Field. Freed from much of the ground routine of earlier schools, Ardery found that the emphasis at Kelly was on flying, not drill and ceremony. Like those of many earlier aviation cadets, his written recollections focused on the night flights made by all students. As always, they were exciting. Even though cadets now had the benefit of radio-beam navigation aids, many cadets still managed to get lost. On a night flight to Corpus Christi, recalled Ardery, one young flyer overshot and flew for some distance over the Gulf of Mexico. Fortunately, he managed to get turned around in time to land at the Corpus airfield just before running out of fuel. Warren Polking, who graduated with Class 40-F, recalled the night flights, too. A shortage of barrack space in 1940 forced many cadets into tents, and Polking remembered that one trick of those cadets returning from a night flight was to glide in over the tent lines, with the propellor of the BC-1 (Basic Combat -1, a trainer similar to the later AT-6) at low pitch. At the last minute, a nudge of the throttle brought a colossal racket from the engine, awakening everyone and giving the incoming cadet a good chuckle to accompany his relief at having completed a successful trip.

"...Early to rise." Reveille always seemed to come too soon.

"5:30 sure comes early in the morning," wrote an anonymous Class 41-I cadet in The Gig Sheet class book. "I don't have to think of what to do, I just get up and start moving and subconsciously I have a broom in my hand." Confronted with the cancellation of a night flight, he lamented: "I have to wait until tomorrow night and go without sleep forever." Some of his troubles might, he admitted, be due to the late nights he was keeping. Although by now aviation cadets no longer excited the interest they once had (Ardery recalled that they were referred to as Gadgets locally, and thought of as something of a nuisance when they gathered in the basement bar of the Gunter Hotel, the site of the Cadet Club during 1940-41), the young flyers still led active social lives. Officially, cadets could not be married, and the lack of parking precluded keeping a car at the field. A local girlfriend who would keep a cadet's car for him, and meet him after flying, was thus important if a cadet expected to make the trips that were a prominent feature of their weekends. The class book for Class 41-G went so far as to describe the nearby town of Bandera as "the cadet's country home." Numerous cadets made regular treks to the town on weekends for horseback riding, eating, and other activities. "Everything but sleep," asserted the writer, "but who goes up to sleep?" In a listing of activities, the classbook recorded a vast array of things that kept already busy cadets on a constant whirl: "Girls ...Tea Dances ...Athletics ...Star Parties ...Bandera ...Girls ...Tennis ...Uniforms ... Convertibles ...Cadet Club ...Riding ...Golf ...Field Days ...Spaghetti Suppers ...Girls ...Gunter Hotel ...Deep Sea Fishing ...Dove



Flying training involved long hours of classroom work as well as time in the air.

Hunting ... Girls ...Beer Parties ...Hangar Flying ...Sweeping Broadway ...Formation Driving ... Girls ...Late Dates ...Ballet ...Symphonies." If cadets worked hard, they played hard, too.

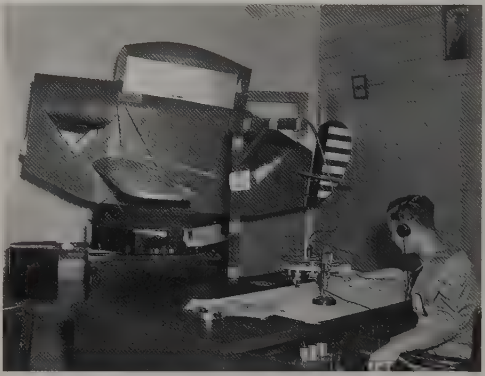
"Hangar Flying," as they called it, referred to instrument practice on the relatively new Link Trainer. The forerunner of modern simulators, the Link Trainer was a "$20,000 flying machine that never leaves the ground." In it cadets could practice instrument flying with no danger of crashing. "A man may hypothetically be killed many times a day, in one of these," wrote a cadet in the class book for Class 41-I, "and still get home to dinner." Reality, though, meant some cadets did not return for dinner. Shortly before graduation, Cadet E. C. McCaffrey died in a crash. Since Class 42-I graduated after Pearl Harbor, his death was no doubt a sobering reminder of the perils they now faced. From the Cadet Club, and Bandera, Texas, "dude ranches," 42-I went directly to war.

Instructor Pilots

A supply of skilled instructors was vital to the success of all Air Corps and Army Air Forces pilot training plans. When the contract primary program got underway in 1939, the civilian schools had little difficulty attracting good instructors. Many had over 1,000 flying hours in their log books. But as the training program expanded, it became increasingly difficult to find, and keep, good instructors. Some held reserve commissions and were called to active duty; others were recruited by the Navy; most were subject to the draft.

The civilian primary schools relied almost exclusively (and the Army-run basic schools to a lesser degree) on civilian pilots. To keep them, the Army Air Forces tried a number of approaches. During early 1942, a large number received direct commissions after completing an instructor's course run by the training centers--if they met the physical qualifications to be a military pilot. However, this was less than half of the instructors who went through the courses, and by the end of 1942 almost all those who could qualify for a commission had one. The Army tried to entice the remainder into the Air Corps Enlisted Reserve, a ploy that failed when most refused. Army Air Forces then proposed to simply give all instructors commissions, a step which Secretary of War Henry Stinson flatly refused, although some experienced instructors were simply commissioned as captains and assigned as supervisors at the contract schools. Attempts to classify instructors as employed in essential war work sometimes succeeded, and sometimes did not. And, as mentioned, despite complaints, the Navy recruited steadily in an effort to find instructors for its own flying schools.

Finding instructor pilots for the basic and advanced schools was also difficult. One source was reserve officers called to active duty; some of whom had already been instructing as civilians. Recent graduates of advanced training were consistently pressed into service, although removal for assignment to a frontline flying unit was a steady drain. A



Beginning in 1941, cadets could practice instrument flying more safely in the new Link Trainer.

Finding enough instructors for the expanded pilot training program was a persistent problem.

third source for basic and advanced instructors was those men who qualified for a commission after completing the instructor courses. Rated as service pilots, these men were not considered for assignment to combat units, but could be reassigned to fly transports, ferry aircraft from location to location, or pilot liaison aircraft. However, the Army Air Forces found them; the struggle to find and keep instructors for all stages of flying training never ceased.

Kelly Field's Central Instructors School

In order to help standardize pilot training, planners pushed for centralized training of instructors as early as 1940, but it was not until mid-1942 that the three training centers actually created centralized instructor schools. The Gulf Coast Training Center submitted its proposal for such a school in June, and the school was activated at Kelly Field on August 10. Planners used three not-yet-activated school squadrons as the organizational structure for what was termed Flying Training Group C, and the first class began on September 1.

Although plans existed almost from the start to consolidate all three instructors' schools at Randolph Field, six different types of instruction were underway at Kelly by the beginning of 1943.

The first courses taught were the Elementary Flying Instructor's Course and the Basic Flying Instructor's Course. Five weeks later, though, instruction was underway in the Elementary Pilot Classification Course, normally the first course taken by a prospective instructor. The Elementary Classification Course lasted twenty days, during which civilian flyers (some of whom had been Civil Service Instructor pilots, and all of whom had a commercial flying license) learned the rudiments of piloting primary training aircraft and were evaluated by the supervising officers. Those who completed this course went

IGHT LINE — KELLY FIELD

Trainers lined up on the Kelly ramp in 1941.

on to either the Elementary Flying Instructor's Course or the Service Pilots Course. This last served to train pilots to fly utility aircraft, although a handful were recycled back into the Basic Instructor's Course. They might still end up as an instructor pilot (most did not), but they would not be assigned to a combat unit.

Officers already rated as pilots began their process of becoming an instructor with the Basic Flying Instructor's Course. A four-week course, the basic course prepared pilots to serve as instructors at the basic and advanced schools. A few might serve at the primary schools, but this was rare. Highly regarded graduates from this course, which might include some pilots who began their training as civilians, went on to either the Advanced Single-Engine Instructor's Course or the Advanced Twin-Engine Instructor's Course. These were the last courses created at Kelly's Central Instructor's School, and, as their names suggest, they prepared future instructors to teach at the advanced schools.

Flow through these courses was rapid. By the time the Central Instructor's School did move to Randolph in February 1943, 2,160 prospective instructors had begun training and 1,691 had graduated.

Navigator Training

Although some specialized training in navigation was provided by Air Corps flying units in the late 1930s, no formal school of instruction existed. Nor did planners initially foresee the demand for navigators until expansion was well underway. The handful of officers the Air Corps did send to school for formal training in navigation went to the Pan American Airways school at Coral Gables, Florida, until a small Air Corps navigation school opened at Barksdale Field, Alabama, in 1940. In 1941, belatedly recognizing the need for navigators, the Army Air Forces ordered individual training to begin at Army fields. The official history of the Army Air Forces in World War II admits, however, that this hesitant beginning meant that "no other aircrew program was started with so few qualified instructors." Demand for navigators far exceeded the supply, and few skilled men could be found to teach at the schools.

The shortage of pilots also had an impact; someone had to fly the plane for navigation students to practice, and there was a persistent shortage of pilots.

In July 1941, the Barksdale Field Navigation School moved to Kelly bringing with it the first cadre

Kelly trained navigators until 1942.

of instructors as well as the course curriculum, schedules, and aircraft. At first it was located in buildings near the Kelly flight line, but in November it moved to new quarters on "upper Kelly," or "The Hill," to the west of Leon Creek. Here it became a part of the emergent preflight school at Kelly.

In addition to the instructors from Barksdale, the Kelly Navigation School obtained a few instructors from Pan American Airways. Most came from recent graduates of the program, a practice common at all Army Air Forces navigation schools during the first few years of the war. The course was fifteen-weeks long, with both course content and curriculum consistent with that used at Barksdale Field. In contrast to the Pan American course, which spent a great deal of time on navigation theory, the Kelly course emphasized dead-reckoning and "practical" navigation. Indeed, following critiques, the amount of theory and ground school instruction was reduced even further as time went on. Training began with twenty students in August, with new classes of twenty men arriving every three weeks. At the end of December 1941, class size increased to 114 men--a class size programmed before Pearl Harbor--rising to 120 per class in February 1942.

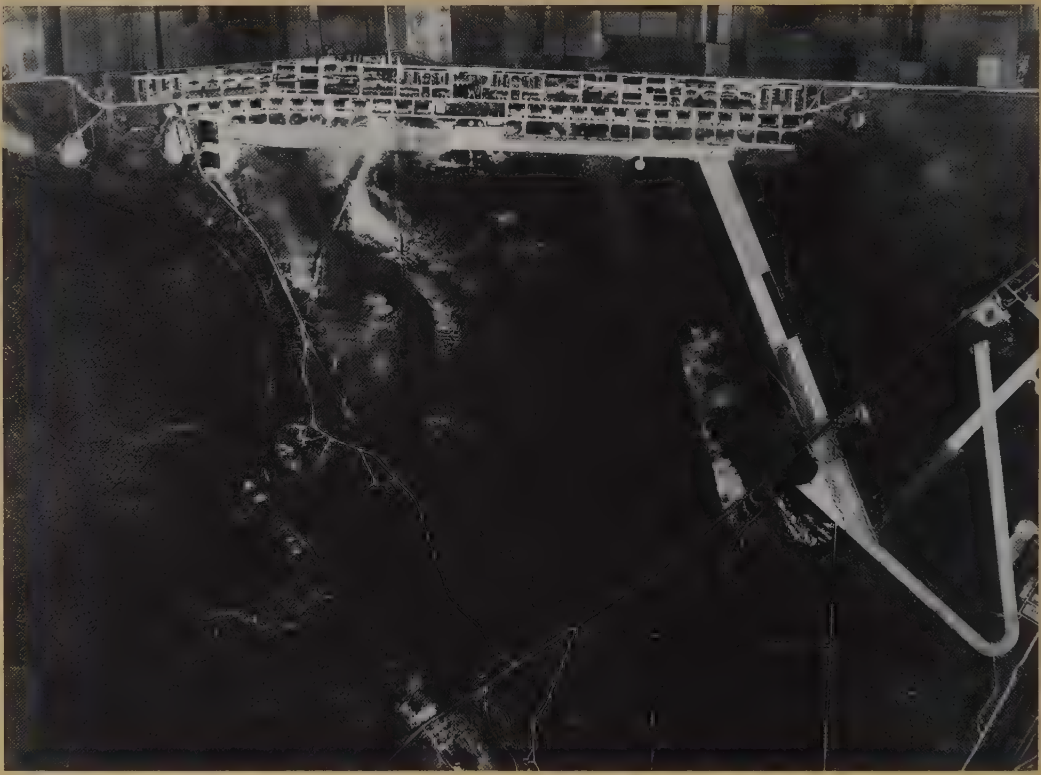
Mathematical skill was, of course, the primary prerequisite for a successful student. A minimum score of seventy-five on a math exam was required, a hurdle which eliminated almost eighty percent of applicants. Naturally, the Army Air Forces looked for prospective candidates from among college students with math and engineering backgrounds first of all. Prior to Pearl Harbor, however, such men were in short supply and the War Department made strenuous recruiting efforts among men attempting to get into flight training programs but who lacked the visual acuity required of pilots. Another source of candidates was men who washed-out of pilot training for flying deficiencies.

During 1942, reports from combat units suggested the possibility of changes in the course curriculum, but before any changes could be implemented, the school moved again, this time to Hondo Army Airfield. By the time it moved 818 men had entered navigator training at Kelly, with 607 men graduating.

Reception and Classification

As it had during World War I, organizing the mass of new soldier-airmen, feeding and clothing them as they made their first adjustment to military life and separating potential pilots, navigators, and bombardiers from among them, was a difficult job. Although the Air Corps began experimenting with various testing methods to identify potential aircrew members, particularly pilots, during the 1930s, the tests were

As in WW I, a tent city sprang up to accommodate arriving recruits in the early days of WWII.



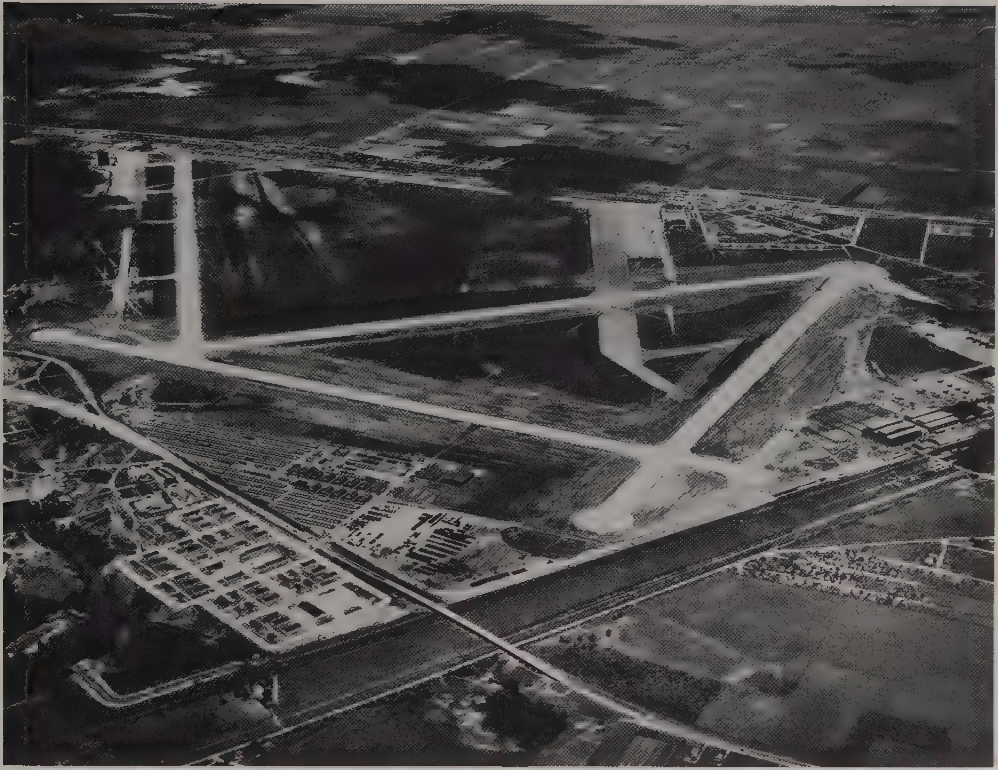
Kelly and Duncan Fields in 1938.

The First Runways

Until the end of the 1930s runways were not an important part of either the Kelly or Duncan Field landscape. Although a thirty-foot-wide concrete and asphalt strip was laid parallel to the Kelly flight line in 1925, it was used mainly as a parking ramp. By 1941 it had been widened to some three hundred feet and was 5,839 feet long and is often misidentified as a runway in some accounts. But student pilots still took off and landed on the wide expanse of grass to the south and east of the Kelly hangars. By this time, though, two actual runways did exist on Kelly. One ran some 3,600 feet roughly northwest to southeast from the east end of the ramp. It was three hundred feet wide in 1941, and actually crossed the boundary between Kelly and Duncan Fields. The other ran some 1,500 feet from the west end of the ramp, also roughly northwest to southeast. Both are now part of Kelly's ramp and taxiway system.

On Duncan Field, a triangular arrangement of taxiways and ramps existed in 1941. One leg of this triangle ran northeast to southwest from the transient aircraft hangars until it intersected the south end of Kelly's east runway. From this point, a leg ran southeast toward the railroad tracks, where it curved into the third leg. This final leg ran almost due north, crossing the first leg and ending at the old Frio City Road.

Grass fields were perfectly suitable for small training aircraft, but the larger and more powerful planes entering the inventory required runways. Thus, in 1942 construction and extension of the runway systems of both Kelly and Duncan Fields got underway. At the urging of Colonel Harvey Prosser, Commander of the Advanced Flying School, Kelly's east runway was extended to a total of 7,500 feet and became a common runway, shared by both fields. Work also went forward on an extension of Kelly's west runway and the Duncan Field taxiways, so that by the end of 1942 aerial views of the fields took on an entirely new aspect. The empty expanses of grass were gone, bordered and cut by ribbons of concrete. This runway complex would remain essentially unchanged until the construction of an 11,500-foot instrument runway in 1955.



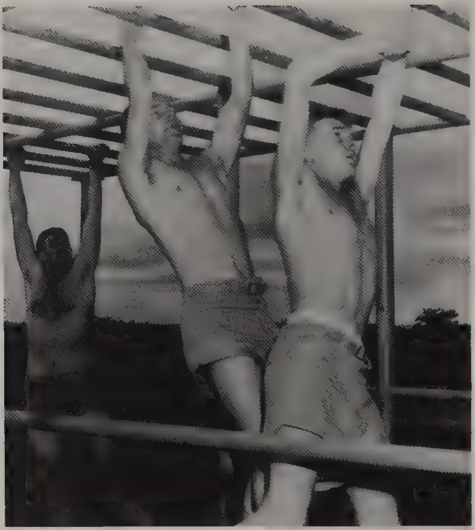
Duncan and Kelly Fields shortly before they were rejoined. The new runway construction is only part of the visible expansion of the two fields.

still new when war broke out. At the same time, facilities to house and train new arrivals simply did not exist; it took time before the Army Air Forces could create a smoothly operating system to sort out recruits and assign them to various specialties.

Selective Service regulations gave the Army Air Forces (AAF) first call on men with any previous aviation experience. This included men whose civilian work was in aircraft manufacture, as well as those with flying experience. By 1942, this meant that a draftee with even a single month of civilian work in almost any facet of aviation was supposed to be slotted for the AAF. Since this policy meant that the AAF got not only most of the technically trained draftees, but also many of the men scoring high on various intelligence and technical exams, the ground forces consistently voiced objections to it. However, except for a brief period in 1943, the policy remained in effect throughout the war.

The development of tests to help identify prospective pilots began in 1941, with the first preliminary test ready by December. Since early navigator, bombardier, and gunner training was incidental to pilot training, planners originally expected to find needed aircrew members from among those who washed out of pilot training. Studies to produce aptitude tests for bombardier and navigator selection did not begin until late in 1941, and Pearl Harbor forced the immediate use of systems that were not completely ready.

At first, Air Corps planners expected the primary flying schools to run a four week orientation program of military and physical training for incoming aviation recruits. By early 1941, however, it was clear that the civilian schools which conducted primary flight training were not equipped to handle this additional burden. So in February, the Air Corps ordered each training center to create a Replacement Training Depot, and in August, the Gulf Coast Training Center formed such a depot under the control of the



Physical training has always been part of a recruit's life.

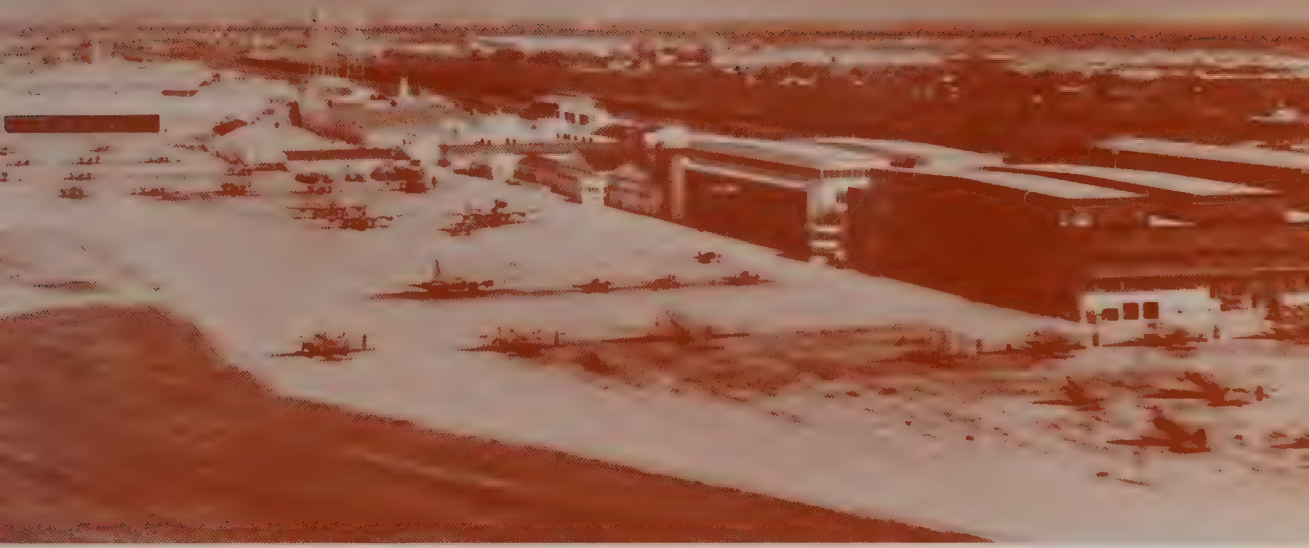
Advanced Flying School at Kelly Field. By then construction was already moving forward. With space at a premium, then-Colonel Frank D. Lackland, Commander of the Advanced Flying School at Kelly, urged the use of an area called "The Hill," across Leon Creek to the west of the flight line. The War Department approved construction of sixty-two buildings as early as February, and construction was underway by the end of the summer. In September 1941, the name of the new facility was changed to Air Corps Replacement Training Center (Aircrew). In April 1942, the title changed again, this time to the Army Air Forces Preflight School (Pilot).

There was no set curriculum at first. Instructors taught courses on a variety of subjects, such as military law, customs and courtesies of the service, organization of the Army and the Air Corps, and so on. Much of the emphasis was on physical conditioning and drill. Over time, preflight training was both extended and standardized. By the end of 1942, preflight training was nine weeks long (doubling the original length), and both the academic and physical training followed a rigid schedule. New classes began every four-and-a half weeks, with 18,349 men passing through between November 12, 1941 and July 4, 1942.

Planners initially expected these reception centers to handle all aviation trainees, but in the fall of 1941 separate centers were created for pilots and navigator/bombardiers in an effort to simplify and streamline training. Kelly's Replacement Training Center was designated a pilot preflight center, with future navigators and bombardiers going to Ellington Field for preflight training. But since incoming trainees after mid-January 1942 were all appointed as aircrew trainees, the process was complicated by the need to classify and sort them so they could be sent to the proper training location. This was something the replacement centers were not originally set up to do. At the same time, numerous recruits arrived out of synch with the start of classes and, thus, had to be held in a sort of limbo until they could be sent on. The result was an informal reception and classification "pool" which existed at each of the main training centers. At Kelly the number of men in this pool was so large by early 1942 that several hundred had to be housed at Brooks and Randolph Fields. Facilities on "The Hill" were not finished, and the vast majority of men arriving during the early days lived in tents wherever they were sent.

Although the "pool" was not an official part of the reception process, it proved an opportune time to carry out classification. In April 1942, the Army Air Forces made a virtue out of necessity changing the informal, unofficial "pool" into the Classification Center. At the same time, responding to complaints from the commanders of the flying schools, who found running the reception/classification process a hindrance to operating a flying training center, both the Classification Center and the Replacement Training Center were separated from the Kelly Field command structure and located at the rapidly growing facility on "The Hill." In July 1942, the various programs for reception and classification were incorporated into a new organization called the San Antonio Aviation Cadet Center (SAACC), run directly

Located on "The Hill" west of the Kelly flight line, the San Antonio Aviation Cadet Center later became Lackland Air Force Base.



Expansion and new construction transformed Duncan Field into a modern industrial facility.

by the Gulf Coast Training Center. In November 1944, the AAF consolidated all preflight training at San Antonio, and in 1947 SAACC became Lackland Air Force Base, still the home of all Air Force basic training and the Air Force Officers' Training School.

Depot Expansion on Duncan Field

As Kelly Field struggled to cope with the expansion of training, a little over a mile to the south, the San Antonio Air Depot at Duncan Field was also in the midst of dramatic growth. Greater numbers of aircraft, pilots, and aircrew meant vastly increased maintenance and supply responsibilities, bringing in thousands of new workers and forcing the construction of new facilities.

Maintenance Organization

Maintenance procedures in 1939 were not all that different from those of the 1920s. After experimenting with a system of sending aircraft and engines in for overhaul after a specified number of flying hours, in 1937, the Air Corps returned to the practice of overhauling planes and engines only when visual inspection indicated a need for it. In general, this meant an engine underwent overhaul about every 400 hours, with aircraft overhauls varying depending on the type and function. Trainers, for example, given the hard use they got at the hands of inexperienced pilots, often went into the shop more often than other types of aircraft.

All maintenance was divided into a three tier, or echelon, system. First echelon maintenance consisted of cleaning and routine servicing, such as changing sparkplugs and oiling, and included both twenty and forty-hour inspections. Second echelon maintenance included replacement of parts and some heavy repairs, including partial engine overhauls, and eighty-hour inspections. Maintenance at both the first and second echelon took place at flying fields, but third echelon maintenance took place only at depots--at least in theory. At the depots engines were torn down and rebuilt, and aircraft were completely disassembled, repaired, and put back together. Although the use of metal wings and fuselages was beginning to alter some depot procedures, many aircraft were still fabric-covered as late as 1937, and many basic processes familiar to mechanics of 1920 were still practiced.

In practice, the line between different echelons of maintenance was not always clear. The availability of equipment and the skills of local personnel often played a larger role in determining the level of maintenance carried out at a particular location. Eventually, Air Force leaders recognized that this gave the maintenance system greater flexibility. In addition, by 1942 the proliferation of repair facilities led to the addition of a fourth echelon. Through the remainder of World War II, first echelon maintenance was defined as that performed by the personnel of the combat unit; second echelon maintenance as the repair work carried out by either the combat unit, air base squadrons, or detachments at commercial airlines; third echelon maintenance as the work done by service groups or sub-depots at flying fields; and fourth echelon maintenance as that done at a specialized depot. To a large extent, the new second and third echelons encompassed the levels of repair formerly included under second echelon maintenance, with the distinction between the two new echelons largely a matter of the kind and transportability of the equipment needed. Normally, second echelon maintenance included work that could be done with hand tools or mobile equipment, while third echelon maintenance normally required bulky, if still moveable, equipment, specialized mechanics, and a limited time for the completion of repairs. In practice, third echelon maintenance sometimes approached the kind of work normally done at a depot.

The Maintenance Command Structure

From 1926 to 1942 the Materiel Division of the Office of the Chief of the Air Corps held responsibility for Air Corps logistics, including supply and maintenance. Headquartered at Wright Field, Ohio, with a liaison office in Washington, D. C., the division also supervised procurement, distribution, and research and development. Supply and maintenance were actually supervised by the division's Field Service Section, which ran four continental air depots. One of these was the Fairfield Air Depot at Patterson Field, Ohio. Two others existed at Middleton, Pennsylvania (Olmstead Field), and Sacramento, California (McClellan Field). The fourth, and largest in terms of responsibility, was the San Antonio Air Depot at Duncan Field.

In 1942, a new facade gave new life to Koerner's 1917 steel-and-concrete hangars. The unique roofline was still visible, however, seventy-five years later.

Radio repair was only one of the tasks handled by the Duncan Field Depot.

Creation of General Headquarters Air Force (GHQ AF) to control the combat units of the Air Corps in the mid-1930s, divided some of the responsibility for maintenance. The Field Service Section of the Materiel Division ran the depots and provided technical guidance, but GHQ AF zealously insisted on operating all maintenance activities on its air bases, as well as operating its own separate supply system. In late 1940, the Field Service Section urged greater centralization, an argument reiterated by the Plans Division of the Office of the Chief of the Air Corps. Under the proposal the Plans Division presented, a new "Maintenance Supply Command" would exercise control over all maintenance and supply activities through the creation of four maintenance and supply wings. Although GHQ AF fought this change, the Air Corps moved in its direction in March 1941 with the activation of the "Provisional Maintenance Command," headquartered at Wright Field and commanded by Brigadier General Henry F. C. Miller, the former commander of the San Antonio Air Depot. Each depot now supervised maintenance activities, insofar as it could, within a specified geographic "control area." This new command became permanent a month later, but its jurisdiction remained limited by GHQ AF insistence that control over maintenance stopped "at the Air Base boundary."

The argument over who should control maintenance at different fields continued even after the creation of the Army Air Forces in June 1941. Although Maintenance Command was able to establish some control over maintenance activities at Air Corps bases, such as those run by the training centers (including Kelly, Brooks, and Randolph Fields) throughout the establishment of so-called subdepots, the Air Force Combat Command (successor to GHQ AF) fought against losing any control over maintenance on its own fields. Eventual resolution

SAN ANTONIO AIR DEPOT

By 1944, the San Antonio Air Depot was a control area command with responsibility for maintenance and supply over all of Texas, Arkansas, New Mexico, and Louisiana west of the Mississippi.

of the dispute took place primarily because General Henry H. "Hap" Arnold, elevated to Chief of the Army Air Forces, favored placing all responsibility for maintenance and supply under a single organization. Despite last ditch opposition from Combat Command, the AAF created Air Service Command in October 1941, and gave the new command total control over supply and maintenance beyond the first and second echelon.

During the war, further reorganizations increased central control over maintenance and supply. In December 1941, Air Service Command established four service area commands to supervise depots in specific geographic regions. Under this arrangement, the San Antonio Air Depot was within the Third Air Service Area, headquartered at McDill Field, Florida. Unfortunately, the geographic limits of the service area commands and the control areas of the depots did not always coincide, creating a great deal of confusion over the chain-of-command. To rectify this, in May 1942 the AAF shuffled the area commands so that the geographic boundaries of the service areas and the various depot control areas no longer overlapped, renaming the depots in the process. The San Antonio Air Depot became the San Antonio Air Service Area Command . While this simplified operations and control considerably, the AAF belatedly recognized that the area commands were an unnecessary layer of command. (In addition, calling the depots "area commands," too, added unnecessary semantic confusion.) In early 1943 another reorganization eliminated the area commands, giving the depots--now numbering nine, with two more under construction--area command responsibility. The San Antonio Air Service Area Command became the San Antonio Air Depot Control Area Command on February 1, responsible for all supply and maintenance in Arkansas, Louisiana west of the Mississippi River, New Mexico, and Texas.

The Sub-Depots

The establishment of the Provisional Maintenance Command in 1941 also resulted in the creation of sub-depots administered by the central "control depots." These sub-depots existed to provide support to operating units, although initially GHQ AF would not let them exist on the fields used by the tactical units, and carried out second and third echelon maintenance of equipment and aircraft to the limit of their personnel and facilities. At first, creation of these sub-depots was concentrated within the control areas of only two depots: the Fairfield Depot at Patterson Field, Ohio, and the San Antonio Air Depot. By Pearl Harbor, fifty-seven such sub-depots existed, and the number increased rapidly thereafter, peaking at 238 in 1944. By December 1942, San Antonio alone had activated sixty-two sub-depots, in many cases by having a sub-depot form sub-depots itself. By that time the increase in the number of control depots was already leading to a steady transfer of administrative control over several of them. By the end of April 1943, San Antonio was still responsible for forty-two sub-depots, but on January 1, 1944 all sub-depots at non-Air Service Command fields transferred to the control of the commands operating those fields. This left only four sub-depots under San Antonio control.

Sub-depots, such as this one at Laredo Army Air Field, helped carry the maintenance and supply load.

With skilled workers at a premium throughout the country, hiring for the sub-depots took time. Recruiting around towns and cities was easier than at more remote locations, and after Pearl Harbor, incoming workers had to agree to accept transfers to any Air Service Command station as a condition of employment. Even so, finding suitable workers remained difficult, particularly given the rapid expansion of the work forces at the control depots themselves and an Air Service Command instruction issued in mid-December 1941 to double the number of workers at sub-depots. Like all other control depots, San Antonio instituted a massive training program, and most sub-depots also provided training. Although the Air Service Command goal was to employ civilians, military personnel made up most of the workers at first. In a handful of instances, military personnel continued to operate sub-depots well into the war, but as time went on they were replaced by civilians at most locations. Air Service Command used the military personnel freed by this process to form cadres for Service Groups, the military equivalent of a sub-depot, and intended to provide first and second echelon maintenance in the field. In August 1944, the various depots lost all technical control over sub-depots nationwide. The same regulation changed the designation, with sub-depots henceforth known as Army Air Forces Base Supply and Maintenance. The depots role was limited to service and cooperation.

Air Depot Detachments

As early as January 1941, the San Antonio Air Depot was responsible for maintenance at civilian primary schools which did not have contracts for the overhaul of their aircraft. The depot also provided supplies and performed maintenance of lend-lease equipment at schools within the control area training flyers for the Royal Air Force. In February 1942, the relationship between the depot and British training schools was tightened, and the depot took over full responsibility for maintenance inspections and overhauls. Teams of one officer and up to seven civilians were assigned to each school. Initially, these were termed Control Depot Representative Offices. In June, however, Air Service Command ordered the depot to activate Air Depot Detachments at all flying training and glider schools within its control area. Three months later, Air Service Command eliminated distinctions between the detachments at the British flying schools and other Air Depot Detachments, and defined more fully the size and composition of all such detachments. In addition, detachments were set up at commercial airline overhaul agencies carrying out fourth echelon repairs (i.e. major repair or overhaul of aircraft or engines) under contracts with Air Transport Command and Troop Carrier Command.

By the end of 1942, a typical Air Depot Detachment numbered between four and seven workers, including an officer (who acted as the depot's contracting and purchasing representative), at least one civilian aircraft or engine inspector, a civilian supply representative, and civilian clerical staff. The civilians were carried on the payroll of the nearest sub-depot, but all military personnel were assigned to the depot headquarters and placed on detached service. In March 1943, the San Antonio Air Depot Control Area Command had responsibility for some forty-nine Air Depot Detachments, many of which

Brigadier General George H. Beverley

George Beverley began his military career in 1917, attending ground school at the University of Texas before moving to Kelly Field where he earned his wings on July 23, 1918. He left the Army in October 1919 for a year and then joined again, coming back to Kelly in 1922 with the Advanced Flying School. In 1923, he participated in General "Billy" Mitchell's experimental bombing of two naval ships, helping to send one of them to the bottom of the sea. After a variety of assignments, Beverley returned to the Advanced Flying School at Kelly in 1928. In the 1930s, he attended the Air Corps Tactical School and Command and General Staff School, flew mail during the Army pilots' stint as "postmen," and served in Panama and Patterson Field in Ohio. During World War II, Beverley served in the 12th Air Force under Jimmy Doolittle and became Commander of the Second Air Service Area Command. After various assignments in Europe, he returned to Kelly Field and assumed command of the San Antonio Air Technical Service Command on April 10, 1945. For two years, he directed the conversion of the world's largest air depot to an efficient, peacetime base for logistical support.

Station "X"

In late 1942, just over a thousand Kelly-trained specialists arrived in Burtonwood, England, to establish an overseas repair and supply depot. For security reasons, the facility was identified during the war only as "Station X," and references in the Kelly Field paper to the arrival and departure of people from overseas often included this mysterious sounding code name. In 1944, Burtonwood was designated as the supply control depot for the European Theatre, with the responsibility for receiving and processing all requisitions for supplies coming from the United States. In addition, along with another English depot at Warton, Burtonwood carried out depot level repair of bombers and transports (Warton concentrated mainly on fighters), allowing the depot groups with the flying units to concentrate on getting less damaged aircraft back into action as quickly as possible.. At the end of the war, Burtonwood closed down, and the secret of "Station X" was revealed. But in 1948, when the Air Force needed an overseas location to service the transports used in the Berlin Airlift, Burtonwood reopened, and the English countryside was once again invaded by Stetson-hatted Texans from Kelly.

were actually outside the boundaries of the official control area. However, partly as the result of complaints about this situation, command responsibility for all but four of these detachments was shifted to the training commands in early 1944. Of the four which remained under San Antonio's control, three were detachments at commercial firms in San Antonio, Dallas, Texas, and Shreveport, Louisiana. The fourth was a detachment at Wichita Falls, Texas, and it was deactivated at the end of February 1944. As the contracts with the commercial firms at the other locations expired, the associated detachments were also deactivated, with the final two air depot detachments controlled by San Antonio ceasing operations in mid-July.

Personnel Acquisition and Training

The growth of civilian strength at Duncan Field was slow but steady during the first years of expansion. Between January 1939 and December 1940, civilian strength grew from 918 to 1,593 in a series of incremental increases. But, during 1941, the pace of civilian hiring began to mushroom. In January 1941 there were 1,867 civilian workers at the depot; by August this number had leaped to 5,126. Yet, impressive as this increase was, it would be dwarfed by the increases which would follow.

In 1939, civilian personnel at the depot were hired through the local civil service board located at Fort Sam Houston. By August, over half of this board's effort was directed toward filling positions at Duncan Field, and in September a board staffed by the San Antonio Air Depot took over responsibility for examining candidates for these positions. At first this was a part-time job for the board members, but by 1940 it was rapidly becoming a full-time effort and the Depot Civil Service Board relocated to the field. In 1941, this board was replaced by a permanent War Department Civil Service Personnel Field Office which began handling the procurement of workers for the entire control area in May. Eventually, civilian strength would peak at some 40,000 in February 1943 at all installations in the control area. The number of civilians at the depot itself, however, did not actually peak, at some 22,117, until 1945. One reason for this is that over the last two years of the war San Antonio gradually lost a number of subordinate and satellite installations, with many functions increasingly centralized at the depot.

The San Antonio depot faced a number of problems in coping with the influx of new workers. Many of them were subject to the draft, making turnover high. Air Service Command regulations forced the depot to seek adjustments to various personnel categories to meet unforeseen needs, and many of the newer employees were inexperienced. Providing training for them proved a particularly difficult problem.

During the 1930s, the training of new employees was largely done through on-the-job instruction. The Depression meant a relative surplus of employees with at least some experience; depot employment needs were small, and it was easy to integrate the handful of new employees into the work force. In February 1940, the Air Corps Materiel Division set the number of positions at different skill levels and pay grades, calling for seventy percent of civilians hired in the depot engineering department to fit within the category of "journeyman and junior mechanics." The maximum number of "senior" employees was set at ten percent, leaving room for only some twenty percent of the positions for relatively unskilled and inexperienced workers. By the end of 1940, however, it was clear that the increasing number of less skilled workers coming into government service was far greater than the existing system

KELLY
FIELD

Expansion of Kelly's work force made traffic jams a fact of life at the field.

would allow. Depot Commander Colonel Henry J. F. Miller, later Commander of Maintenance Command, argued that the entire complement of the engineering department needed to be set up on a different basis to give greater flexibility in hiring.

In January 1941, Air Corps Materiel Division revised the established personnel percentages for the engineering department of the depot very much along the lines recommended by Colonel Miller, and in February revised the schedule of complements for headquarters and depot supply departments to match this. However, while this did create somewhat greater flexibility, it did not completely solve all the problems. By May 1941, the pressure to bring in new workers forced Maintenance Command to lift all restrictions and allow depots to amend local complement structures as necessary.

After Pearl Harbor, even this was not enough. By the beginning of 1942, depots had authority to hire in whatever numbers and at whatever skill levels they could. One consequence of this was a rapid increase in the number of women employed at the depot; a demographic shift echoed throughout the country. By the end of 1942 some twenty-seven percent of the depot work force were women.

As the number of relatively unskilled employees at the depot increased, it also became clear that the dilution of the work force created by their presence meant that on-the-job training was no longer practical. Instead, the depot pioneered a program of pre-employment training from the beginning of 1941. Although the depot tried to develop a training plan in concert with city and state agencies, this effort toward cooperation broke down, and in the spring the depot simply went ahead on its own. In May, Mr. A. T. Economy, foreman of the Electrical Department, became head of what was called the San Antonio Aircraft School. Established in rented facilities off-base, the school attracted an immediate surge of enrollment; 2,500 students were taking classes in a three-month program by July. These students were not compensated for their class time, but under the urging of Depot Commander Colonel C. McMullen, Air Service Command authorized paying them under the designation "student-trainee" in October 1941.

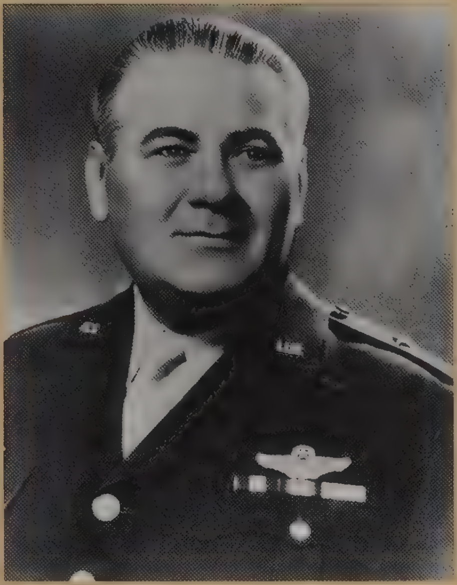
Kelly workers line up for a meal from one of the many mobile canteens used at the field.

By this time enrollment had reached 4,724 students, with a total of some 6,956 either in training or already at work. By this time, too, the school was called the San Antonio Depot School, and it moved to Duncan Field in October. Maintenance Command did not create a training program of its own until September 1941, and the program which emerged was modeled after that created in San Antonio.

In January 1942, the Texas Board for Vocational Education finally reached an agreement with the depot and the city of San Antonio to assist in the training and certification of instructors. About fifty of the "oldest and best" men in the depot school received six months of combined classroom and practical instruction under this program. They were exposed to all theories of teaching as well as practicing their skills in shop settings, and for part of the

Payday at the depot near the end of the war.

time had the benefit of technical instruction by professors from Texas A & M University. By February 1942, the program was also training instructors for the sub-depots and providing instructional materials. As early as August, the San Antonio Air Depot had printed and distributed over 234,000 technical and administrative manuals for some 173 different courses.



Brigadier General Morris Berman

Spanning over three decades, Morris Berman's career is a military success story--from private to general. He enlisted in the Army in 1912, rising to the rank of sergeant. In 1917, he was commissioned as a second lieutenant in the Aviation Section of the Signal Corps, learning to fly in Florida before coming to Kelly Field for the first time in 1922. After graduation from the Advanced Flying School, he served as Kelly Field's adjutant until late 1923. After a variety of assignments, including first commander of the new Randolph Field, Berman returned to Kelly as the field's supply officer. From 1934 to 1937, he was the executive officer at the San Antonio Air Depot on Duncan Field. In 1940, Berman was sent to Hill Field, Utah, to build the new depot there. He is still regarded as the "Father of Hill Field." General Berman returned briefly to command Kelly in 1944 before going overseas to take charge of Burtonwood Air Depot in England. He died in 1945. His private-to-general rise was an inspiration to all servicemen.

As civilian strength neared its peak, the need for pre-employment training began to wane. By the end of 1943, on-the-job training once more seemed a practical alternative. Air Service Command was, by now, committed to some form of pre-employment training, and was reluctant to end it altogether. And, by March 1944, the San Antonio Air Depot Control Area Command, after a brief experiment with older training methods, was forced to reestablish pre-employment training, albeit on a much smaller scale.

Military Training

Individual training of ground technicians, including mechanics and supply specialists, was the responsibility of Technical Training Command (merged in 1943 with Flying Training Command to form, simply, Training Command). Aircraft mechanics went through a basic aircraft mechanics course which was shortened from thirty-eight weeks in 1939 to 112 days by 1943. In addition, through association with private companies, colleges, and other agencies, the AAF also offered specialized courses in armament servicing, engine repair, electrical systems, and a variety of other subjects. At the end of their individual training, ground technicians were theoretically capable of performing first, second, or third echelon maintenance on the system of their specialty.

During the war, large numbers of women joined the Kelly work force. Collectively they were called "Kelly Katies."

By the end of World War II, Kelly aircraft overhaul efforts concentrated on B-29s destined for the Pacific.

Although many of these individually trained technicians were eventually assigned to combat organizations to provide first and second echelon service, most were assigned to service and depot groups. These latter organizations provided third and fourth echelon support of combat units overseas, and their personnel were, because of the level of support involved, trained by Air Service Command. This not only created jurisdictional arguments between Training Command and Air Service Command, it also posed problems for the depots; they had to fit this training around their regular operations.

No precedent and no fully-developed plan existed for the training of air depot or air service groups when the San Antonio Air Depot activated the 3rd and 5th Depot Groups in May 1941. Most of the men assigned to these organizations already had some second and third echelon maintenance experience from prior service with Flying Training Command. For several months, the members of both groups gained experience with depot procedures through on-the-job training alongside depot civilian employees. Although the 5th Depot Group went to the new Warner-Robins Depot in December 1941, the 3rd did not ship out until it headed overseas in March 1942. By then, the San Antonio Air Depot had already activated seven more such groups, and had begun to establish a consistent training regimen.

The creation of a Training and Liaison Office in March 1942 provided some central control over the training process, which remained on-the-job training. Although working alongside the permanent depot work force did provide a daily experience of depot procedures, the training of military personnel alongside civilian employees created friction since the two groups worked similar hours but under vastly different rules. Eventually, the entire night shift from 10:45 PM to 6:45 AM was set aside for military training, but this was at best a partial solution. Night work was limited in variety and amount, and it was impossible to train the military groups in the appropriate clerical and administrative tasks since depot practices in these areas differed significantly from the practices in the field. The eventual solution was to set up entirely different depot training groups, physically separated from the civilian depot shops and devoted solely to preparing military groups for their specific jobs. This did not eliminate all problems, especially the shortage of the kind of combat aircraft these men would work on in the field, but it did go far in resolving the majority of the most pressing difficulties experienced in trying to train military personnel while the civilian shop workers continued to carry on regular maintenance.

The Consolidation of Duncan and Kelly Fields

By the end of 1942, the expansion of depot activities meant increasing aerial congestion over Duncan and Kelly Fields. Student-flyers at Kelly usually took off to the south, crossing over the Duncan flight path and creating increasingly hazardous conditions. By this time, too, Kelly Field no longer played a paramount role in flying training; the opening of numerous other advanced bases throughout the country meant that Kelly's flying training load could easily be absorbed elsewhere. Relocating or building a large depot industrial facility from scratch was far more difficult, not withstanding the establishment of the new depots since 1940. In December 1942, Colonel Paul Wilkins, Commander of the San Antonio Air Depot, wrote to Brigadier General L. P. Whitten, the Director of AAF Base Services, to argue that a partial allocation of Kelly Field to Duncan Field, and the construction of new runways, would "postpone but not prevent a ... disaster." Under existing circumstances, Wilkins claimed, "Duncan Field cannot efficiently carry out its assigned program." The only realistic answer was expansion, and "the only satisfactory expansion is the absorption of Kelly Field" in its entirety. General Whitten and the AAF high command agreed, notifying Air Service Command on January 4, 1943 that "consolidation of Duncan Field and Kelly Field into one reservation has been approved by this headquarters."

Local preparations for the merger began almost immediately, but the actual transfer did not occur until April 21, giving time for training operations at Kelly to slowly wind down and for a boundary to be set between the former flying field and the San Antonio Aviation Cadet Center, now firmly established to the west of Leon Creek. Indeed, even before the official consolidation date, a number of hangars, barracks, and other buildings were turned over to the depot. Although there was some consideration for naming the newly merged fields in honor of Major Duncan, sentiment and tradition were among the factors which persuaded the AAF to keep the name Kelly Field. As Colonel Wilkins pointed out, "the

The training of military depot groups was an important mission during World War II.

original Kelly Field [Kelly Number 1] is Duncan Field," and it made historic sense to unite the fields under the older and more famous name. Nevertheless, the 1943 merger marked a departure from both history and tradition. After twenty-six years as one of the country's most important flying training fields, and two decades as the "finishing school" for Army pilots, Kelly's mission would henceforth be supply and maintenance.

Reorganization and Restructuring

Even before the merger of Kelly and Duncan Fields, the AAF undertook another reorganization of its maintenance and supply arrangement, abandoning Air Service Area Commands in favor of Depot Control Area Commands in February 1943. Under this reorganization, the San Antonio Air Depot became the San Antonio Depot Control Area Command, exercising both depot and command functions. Less than four months later, in May, the depot became the San Antonio Air Service Command, a name change that did not alter its responsibilities. This does not mean, though, that internally the organization of the depot remained unchanged. Indeed, restructuring within the depot was constant

Brigadier General Paul C. Wilkins commanded the depot during the consolidation of Kelly and Duncan Fields.

How's the Weather, Ma'am?

That phrase echoed throughout the later years of World War II, particularly at Kelly Field. The 3rd Weather Region, headquartered at Kelly Field, decided to create an all-Women's Army Corps (WAC) weather station, freeing more men for duty overseas. All "Weather WACs" in the 3rd Region were ordered to Kelly in July 1944. The WACs accomplished this mission without any formal training, since most of the training for the WACs was completed "in-station," or on-the-job.

The weather station at Kelly operated around-the-clock. The WACs deciphered coded reports from the station's teletype machines, which received information from stations all over the United States, Canada, Mexico, Central America, and islands in the Atlantic and Pacific Oceans. A WAC's observation duties included reading thermometers, psychrometers, and conducting winds aloft observations, which told wind direction and speed at different altitudes. The information received from the teletype machines was then combined with the information gathered at the weather station to forecast the weather. The WACs did this by accurately plotting precipitation, fronts, and high and low pressure areas on synoptic maps for use by both pilots and navigators. The forecaster would also post her forecast for the various flying patterns and altitudes.

By the end of the war, only weather personnel who had been overseas or had enough points for length of service were eligible for discharge. Kelly's weather station began getting a stream of male weather observers, and forecasters who worked with the WACs until they received their discharges. The dedication displayed by the Kelly Field "Weather WACs" during the war exemplifies the commitment Kellyites have had for three quarters of a century.

during the war, with new offices proliferating, especially early in the war when expansion was particularly rapid. Organization charts for much of the early war period are, as the historian of that period lamented, "non-existent." Headquarters organization was "completely fluid," and only in the supply area did the basic structure tend to remain constant. Even here, though, the surge of new workers, and the addition of hundreds of new items of equipment, forced the development of new methods of counting, storing, and retrieving material.

In July 1944, the AAF formed the Materiel and Services Command by combining the Materiel Command with the Air Service Command. On September 1, 1944, the new organization was redesignated the AAF Air Technical Service Command. As a result, the San Antonio Air Service Command became the San Antonio Air Technical Service Command. By this time Kelly Field was earmarked as a key depot for the overhaul of B-29 heavy bombers and the R-3350 engines that powered them. Full production facilities did not exist at the field until mid-1945, but ten days after Kelly workers finished overhauling their first R-3350 forty-five more were under repair and the assembly line was operating around the clock.

Warehousing and the Acquisition of Normoyle Quartermaster Depot

By 1944, the accumulated materiel at the depot was straining available storage space. The merger of Kelly and Duncan Fields provided some space, as did the construction of six enclosed warehouses and six open-air storage sheds north and east of the old Kelly Number 2 flight line. But these buildings were soon jammed as well. As long as the depot operated or

In 1945 Normoyle Quartermaster Depot became East Kelly.

Warehouse space was in short supply by 1944.

administered sub-depots and other satellite facilities, it had been possible to store many items elsewhere. The steady consolidation of more and more activities at the depot itself simply emphasized the fact that construction had never fully kept pace with expansion, a situation compounded when the Army Air Forces ceased funding any new construction projects after Germany surrendered in May 1945. In June, the AAF deactivated the specialized depot at the former Normoyle Quartermaster Depot just to the east of Kelly, and consolidated this installation with Kelly Field under the designation East Kelly. Normoyle's warehouses and other facilities were a welcome addition to those at Kelly, but its acquisition by the depot did not end the shortage of warehouse space.

Victory

In August 1945, the dropping of atomic bombs on Hiroshima and Nagasaki triggered the surrender of Imperial Japan. Although the end of the war could be sensed, and ever since the surrender of Nazi Germany the previous May there had been a steady contraction of work load and personnel, the final end came with dramatic suddenness. Shipments destined for the Far East abruptly stopped; all overhaul of aircraft, engines, and equipment (aside from cargo aircraft) ceased immediately; civilian work force cutbacks began at once. Surprisingly, resignations were far higher than anyone anticipated as workers, including thousands of women, returned to peacetime pursuits. Arbitrary cuts in the civilian work force did not have to begin until October. By then the civilian strength of the depot work force had fallen from around 19,200 in July to just 14,941, and was continuing to drop.

For the short run, Kelly's exact role was uncertain. Flying training was now conducted elsewhere; operational units that remained activated were stationed at other fields; the size and scope of depot operations were undefined. There was no doubt that Kelly would continue to be an important part of American defense, but as the nation and the military groped their way into an uncertain future--at once unknown and bright with promise--no one could say exactly what changes were still to come.

★ VICTORY EXTRA ★

ALLIES WIN V-E

The Flying Times

Vol. 4—No. 10
May 8, 1945

Warmly elated over Germany's unconditional surrender to the Allies, 25,000 Kelly Field soldiers and war workers flocked to V-E-Day ceremonies this morning, then immediately afterward returned to their training and jobs to fulfill their obligation to the fighting men in the Pacific.

The surrender, announced at 8 a. m. Kelly Field Time by President Harry S. Truman, followed a flood of reports of the Nazis' capitulation which had GIs and war workers keyed to a high pitch of excitement. Crowds at the ceremonies, highly enthusiastic yesterday, reacted calmly today when the official communique on the European war was recited.

The Associated Press Staff first broke the news. The Germans signed the papers by which they laid down their arms at 19 minutes before 3 a. m yesterday, French time, in a little red school house at Reims, France.

That's where General Ike has his headquarters.

The Allied capitals went wild over the news. In London, the crowds jammed Piccadilly Circus. And New York is staging one of its biggest ticker tape celebrations.

Here's how the news of Germany's unconditional surrender unfolded yesterday.

It began with a Danish broadcast that Norway had been surrendered unconditionally by the Nazis.

Then the new German Foreign Minister, Ludwig Schwerin Von Krosick, said in a broadcast to Germany that—"After almost six years of struggle, we have succumbed."

Von Krosick said that Admiral Doenitz had ordered the unconditional surrender of all fighting German troops, including all Nazi U-boats. Then at 9:35 a. m. yesterday came the Associated Press flash from Reims, France, telling of the signing of the unconditional surrender at General Eisenhower's headquarters. Germany had given up to the Western Allies and to Russia.

President Truman proclaimed complete and unconditional victory in Europe. In a VE proclamation, the President said that our blows will continue until the Japanese also lay down their arms in unconditional surrender. The president said next Sunday, Mother's day, is a day of prayer in which he wanted all to join.

At last reports the Americans were approaching Prague, with the Russians about 50 miles away on the other side. It is entirely possible that fighting will continue there for some days. German communications are so chaotic that the order from the High Command to surrender may not be received immediately by many units in the field.

While the Allied world jubilantly hailed the momentous news, there remained a grim reminder out in the Pacific that another big war still looms ahead.

Military and civilian speakers set this dominating theme at the Kelly Field rallies. It was best summed up by Brig. Gen. George H. Beverley, SAATSC Commanding General, who stated:

"Above all, today, all fighting Americans—each soldier in our ranks, each war worker on our production and supply lines—every man, woman and child must make a grim resolution. For this is the day on which, by word, by action and by deed, we must assure our embattled forces on the other side of the Pacific that we will see them through to final victory over the despicable Jap."

Chaplains opened the ceremonies with prayer—giving thanks to God for His help and guidance in the past and beseeching His protection for American soldiers and their Allies who still must fight in the Pacific.

The terms of the surrender imposed on Germany have not yet been announced. But the Nazis, who began the war and caused 40,000,000 casualties in the global conflict, surrendered with pleas to the victors for mercy. In his broadcast to the Germans, the German surrender Foreign Minister, Von Krosick, said: "Nobody must deceive himself over the harshness of the conditions. We had to accept them."

Defeat of the German Army climaxed almost six years of violent, bitter fighting which has engulfed all but a very few of the nations of the

(Continued on Page 2)

Top Leaders in European War

—Courtesy of San Antonio News and Express.

Gen. of the Army Dwight Eisenhower

General of the Army
George C. Marshall

General of the Army
Henry H. Arnold

TOP
LIFT HERE
REUSABLE CONT
CAUTION
AIRCRAFT ENGINE
HANDLE WITH CARE
BEFORE OP CONTAINER
PRESSURE
AIR

CHAPTER FIVE

From Independence to Dominance:

The Cold War Years

Legacy of the Second World War

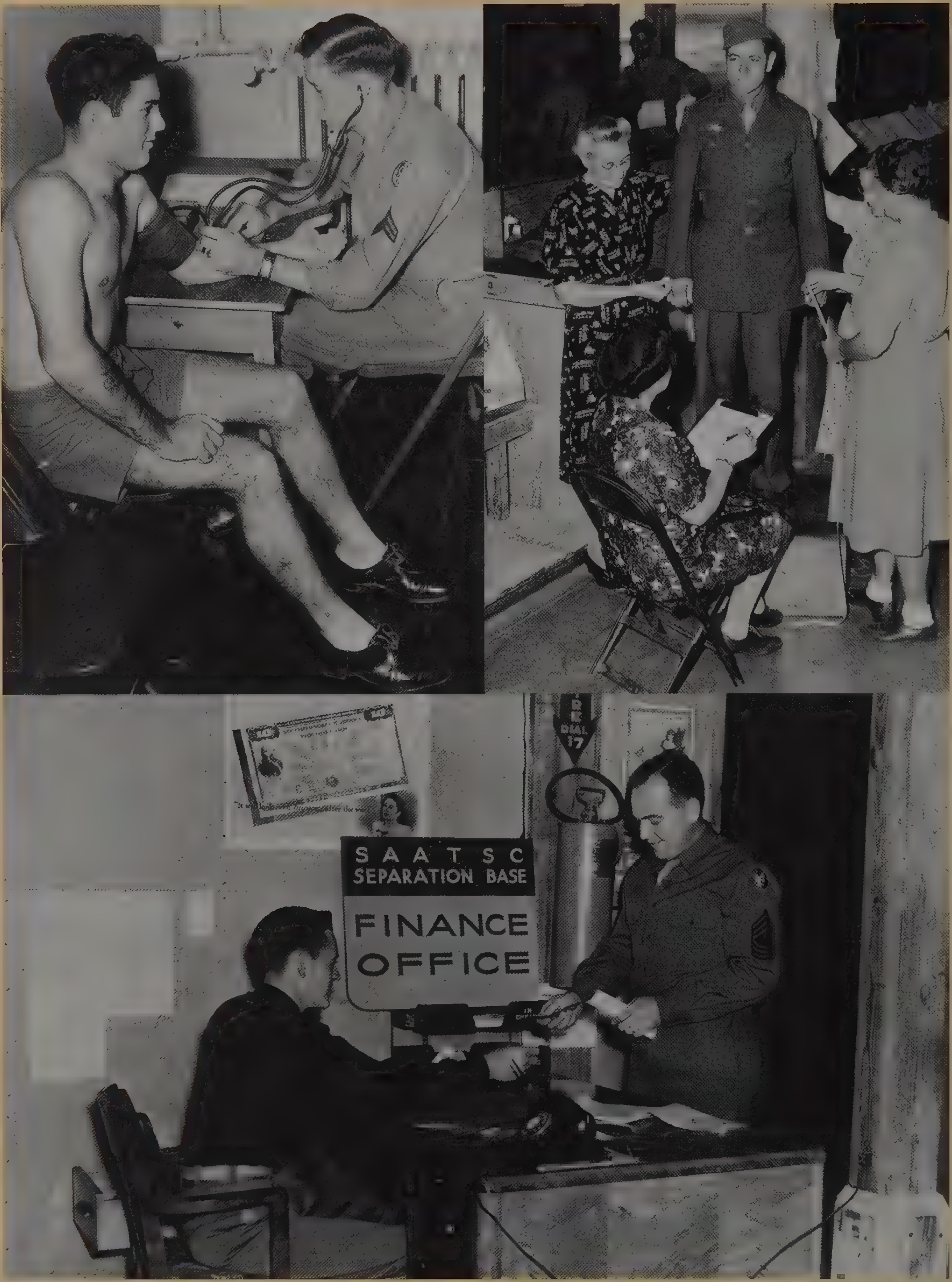
Dismantling the Machinery of War

Even before President Harry S. Truman announced V-J Day on August 14, 1945, the Air Technical Service Command (ATSC) at Patterson Field, Ohio, had begun preparing for peace. With the war rapidly coming to a close, the Army Air Forces found itself with more personnel, more aircraft, more air fields, and more equipment than it thought it would ever need. On August 12, ATSC directed its depots to stop repairing all but cargo aircraft and instructed the depots to release all civilian personnel except those working on transports and associated systems or needed to store aircraft and equipment.

San Antonio Air Technical Service Command (SAATSC) returned to peacetime operations with a jolt. One of the first steps SAATSC took was to cut its work week back to forty hours, starting Monday, August 27. September 1 was the first non-working Saturday since the war began. Maintenance priorities shifted from the B-29 bomber and R3350 engine to C-46, C-47, and C-54 transports and their R2000 engines. The Supply Division discontinued all overseas shipments except those in support of Air Transport Command, the Army Airways Communications Service, and the Weather Service. Aircraft and equipment storage and disposal became growing concerns.

With the declaration of victory over Japan, troops arriving at Kelly were screened. Those having high service points, or over the age limit, were discharged. Those not so lucky were assigned to base squadrons.

Facing Page: Engineers at Kelly pioneered the use of pressurized "cans" for the storage and shipment of engines.


S A A T S C
SEPARATION BASE
FINANCE
OFFICE

Physicals, at least as thorough as the ones given upon entering the Army, were given to the men who were finally on their way home after World War II. Processing for separation included a fitting for a new uniform, and one final trip to the paymaster.

The need for thousands upon thousands of civilian workers disappeared. Within a week of V-J Day, Kelly's Civilian Personnel Office received 536 resignations, 202 of whom were "Kelly Katies." By the end of August, SAATSC received instructions to implement a reduction-in-force (RIF), which called for a 3,100 cut in authorizations by the end of September; 1,550 by November 1; 1,575 by December; and another 666 by January 1, 1946. Voluntary resignations covered the first 3,100-position cut, but RIF procedures were needed to meet the other personnel reductions. Kelly's civilian manning had dropped from 14,941 in September 1945 to 11,464 in June 1946. The Maintenance Division absorbed a majority of the initial cuts; but Kelly's Supply Division, the second largest organization within SAATSC, took its fair share.

With victory achieved, the public clamor for rapid demobilization was persistent and loud. By September 1945, an extensive separation program for military personnel had sprung up. One hundred fifty-five separation centers opened around the United States, including Randolph Field and the San Antonio Aviation Cadet Center. But these centers couldn't out process people fast enough. As the number of personnel eligible for demobilization mounted, more separation centers opened. With a backlog of approximately 3,000 enlisted men and fifteen officers waiting to leave the service, SAATSC established its own separation point on East Kelly. The 4505th Army Air Force Base Unit operated the center for about fifty days, discharging an average of 100 men a day. By the time Kelly's separation center closed on November 24, it had processed 122 officers and 3,851 enlisted men, completely eliminating SAATSC's backlog. Between September 1945 and June 1946, Kelly's officer manning dropped from 1,066 to 450, while the number of enlisted men assigned plummeted from 15,180 to 2,019.

Innumerable, daunting tasks faced those logistical organizations given the job of dismantling America's machinery of war. Glutted supply pipelines connecting Army Air Force units around the world had to be cleared. Air fields and stations had to be closed. Enormous quantities of material from all parts of the globe had to be sent back to the United States. Contracts had to be cancelled and all manufacture of Air Force goods halted. Millions upon millions of dollars of surplus supplies, material, and aircraft had to be disposed of, turned over to the War Assets Administration, or identified and stored.

Air Materiel Command (AMC) and ATSC shared responsibility for disposing surplus Army Air Force property with two other governmental agencies, which unfortunately were ill prepared for the enormous volume of surplus goods that quickly piled up. As of June 1945, ATSC had declared $133 million worth of property as surplus, but the Surplus War Property Board had only disposed of materiel worth $17.5 million. By December 1945, ATSC found itself with over $960 million worth of surplus property.

When covered storage ran out, material was covered with tarpaulins and routed to its next destination as soon as possible.

Tractors as well as aircraft began stacking up at Kelly after the war.

San Antonio Air Technical Service Command's Supply Division had to receive, store, administratively manage, and dispose of the surplus and salvageable material that arrived at Kelly. In fact, disposal of this property became such a major function that it seemed the division's mission changed from that of supplying material to disposing of it. The arrival of enormous amounts of surplus and salvageable property created an immense backlog of material for disposal and a critical need for storage space. Most of this material had to be screened and classified, a time consuming job for which SAATSC was undermanned. Supply Division managers opened five large salvage yards and five warehouses on North Kelly and used two other buildings for storage on East Kelly.

To speed disposal of salvageable material, SAATSC created a Small Lots Sales Office in January 1946. In the first six months of the year, sales at the new office jumped from $4,000 to $58,800. Lingering shortages of copper, lead, steel and other metals in the civilian economy increased the demand for salvaged material, and all military services took advantage of that demand to unload their surpluses. In addition, the government gave as much material as it could to schools, the Civil Air Patrol, the Veterans Administration, and other similar organizations. By the end of 1946, Kelly saw a significant reduction in its salvage work load. A backlog of 12,000 tons of salvageable material in July 1946 dropped to a backlog of only 2,500 tons by June 1947.

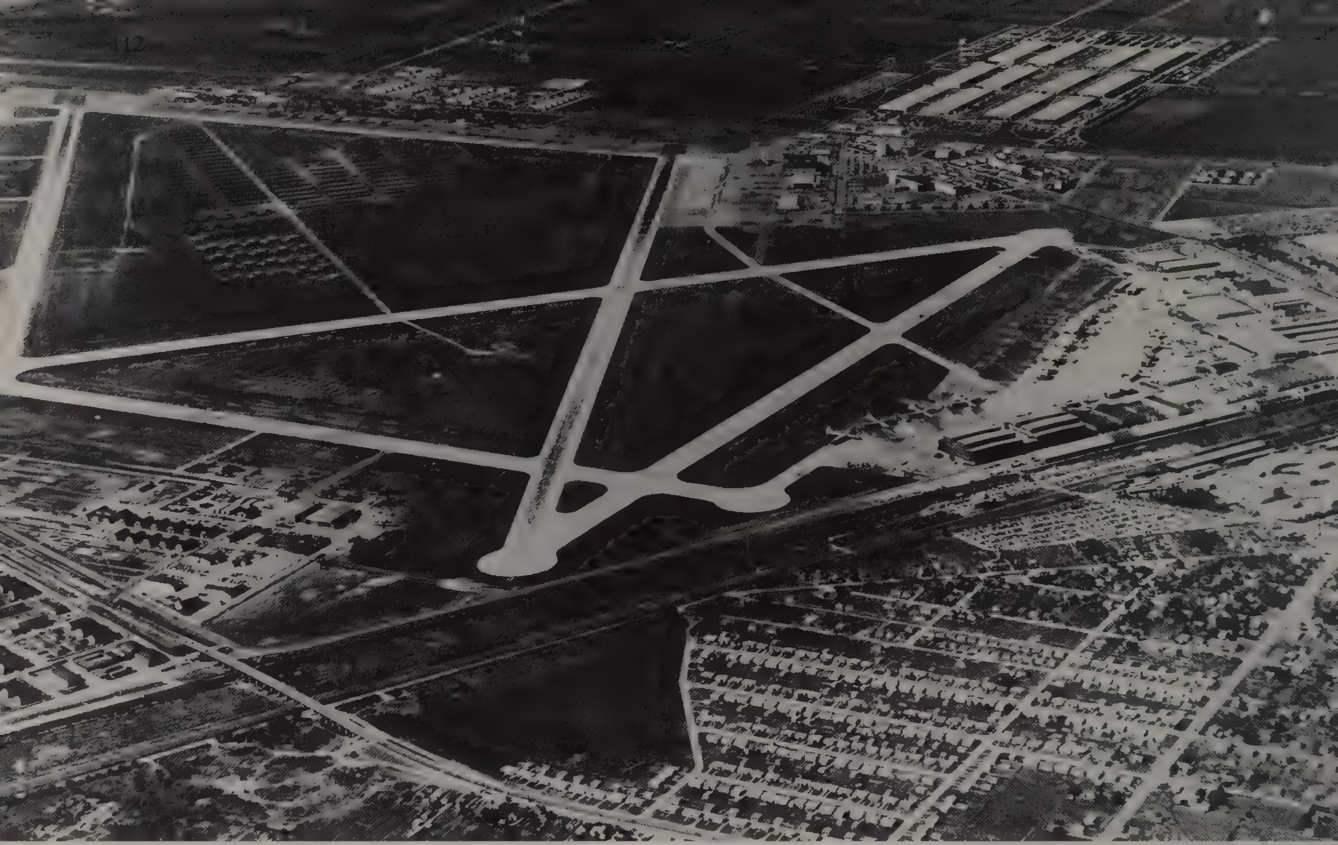
The situation with surplus material was just as critical. Named as specialized depot for special purpose vehicles (trucks, tractors, forklifts, tugs, and fuel serving units), Kelly received approximately 4,000 freight carloads of these vehicles between October and December 1945. In the last four months of 1945, the Supply Division's Reparable Branch warehouse received 3.5 million pounds of material. If the forms were filled out properly, some of this material was transferred to the War Assets Administration or to salvage. Most went into the reparable backlog. With covered storage space at a premium, most material stayed stacked outside, covered with tarpaulins. The monetary value of the surplus material on hand at Kelly reached a high of $160 million in August 1946. Hard work and dedicated effort brought that down to only $10 million by December 1947.

Aircraft Storage

Adequate storage for surplus aircraft was another challenge facing the Army Air Force's logistics commands. From a wartime peak of 80,000 aircraft, the active inventory dropped to only 12,000 airplanes by the middle of 1947. Operational units would use some of the surplus airplanes; Reserve, Air National Guard, and training units would fly others; and foreign countries would buy still more. Nevertheless, many aircraft would stay in storage indefinitely, and maintenance personnel would have to treat each of them for protection against corrosion. As a further complication, there were six times as many aircraft to store as there was available space. By the spring of 1945, ATSC realized it had to acquire new facilities, which had to meet certain criteria: they should be located in dry climates, convenient to staging areas, and they should have a relatively large work force readily available.

Army air fields in the Southwest met the criteria. In October 1945, SAATSC officials began discussions on transferring airfields to their jurisdiction for the storage mission. On November 1, Hobbs Army Airfield, New Mexico, shifted from the Army Air Force Central Flying Command to SAATSC, primarily to store P-51 "Mustangs" and A-26 "Invaders." The 4160th Base Unit moved from Albuquerque, New Mexico, to Hobbs to man the airfield. On November 15, 2nd Air Force transferred two of its fields to SAATSC to store B-29 "Superfortresses:" Pyote Army Airfield, Texas, and Davis-Monthan Field in Tucson, Arizona. Davis-Monthan turned out to be an ideal storage facility; aircraft stored there always stayed in better condition than those stored at other locations. Even when 2nd Air Force's successor, Strategic Air Command, reclaimed the field on March 31, 1946, the ATSC organization remained a tenant at the field.

P-51 "Mustangs" awaiting disposition after the war. Some were turned over to Air National Guard units.



Aircraft storage increasingly became an important mission after the war.

Kelly, too, was a storage site. In September 1945, the south Texas field had approximately 700 B-29s, B-32s, and P-51s in storage. That number dropped to and remained around 500 during 1946, but increased in the fall of 1947 with the inactivation of several airfields around the country, including one of Kelly's installations, Hobbs Army Airfield. Kelly prepared for the influx of approximately 3,000 more aircraft, primarily AT-6 "Texans" and P-51s. The number of aircraft peaked on November 10, 1947, when 2,593 planes rested in row after row on the grassy fields between the runways.

With the closing of other airfields and the additional storage work load, Air Materiel Command told Kelly officials they would pick up another 600 manpower authorizations. Most of these positions went into the Maintenance Division for the storage program since maintaining aircraft in storage was a time consuming job. The hardest part was the initial corrosion treatment, after which each aircraft received weekly, monthly, and ninety-day inspections. At the ninety-day point, workers resprayed the engines with a special rust preventative mix and repainted the tires to prevent them from cracking.

Cocooning

While this method of corrosion treatment worked, it was both time consuming and manpower intensive. AMC desperately needed an inexpensive, long-term solution to the problem of storing the thousands of aircraft left over from the war. In the spring of 1946, the command thought it had found the answer with a new type of spray-on plastic. Command managers selected the B-29 to test this new method called "cocooning." Prior to cocooning, workers spent 100 hours per aircraft per month to maintain a B-29 in storage; AMC officials expected the new method to cut this time to only two hours per aircraft per month.

To cocoon an aircraft, workers washed, cleaned, and completely dried the aircraft. They then taped the frame in a gridwork pattern, sprayed on the webbing solution, reinforced the webbing with two coats of red and yellow plastic solutions and asphalt, and then applied a coat of aluminum spray to reflect heat and light away from the plane. Theoretically, an aircraft cocooned this way could be stored indefinitely. When needed again, workers would remove the webbing, gas and oil the plane, and perform a test flight.

Master Station Plan

By 1945, War Department officials already were planning for the future by directing each installation to prepare a Master Station Plan to plot out a ten-year program for facility and land use, identify temporary buildings to tear down, and map out construction of millions of dollars worth of new permanent buildings in an orderly, predetermined manner. Kelly personnel began working on their ten-year Master Station Plan in the fall of 1945, claiming that when completed, Kelly's plan would identify every future building down to its location and architectural design.

These plans envisioned a much different Kelly, including construction of a giant 50,000-person football stadium, a baseball arena with seating for 5,000, and a 2,500-unit housing program for both officer and enlisted personnel. Plans also called for converting building 1625 (the old miniature range building), into a new, two-winged headquarters facility.

While none of those buildings ever materialized, some of the plans for the "Kelly of the future" did become reality. As early as 1945, Kelly officials realized the runways and depot maintenance facilities built in the '30s and '40s were much too small. They knew they had to reposition and lengthen Kelly's runways, requiring demolition of the old, historic Kelly Number 2 flight line. They planned for construction of the world's largest hangar for depot maintenance of all types of aircraft.

As the chief of Kelly's Air Installation Office stated, "Ten years is really a very short time for planning the world's mightiest air depot, especially with guided missiles, rockets, and atom bombs on the horizon!"

Lieutenant Colonel Glynn O. Mount, Chief Air Installations (second from left); Brigadier General George H. Beverley, San Antonio Air Materiel Area Commander; and Lieutenant General Nathan F. Twining, Commander of Air Materiel Command, discuss Kelly's Master Station Plan with an unknown officer.

The command choice six sites for the project: Davis-Monthan and Pyote Air Fields and San Antonio, Ogden, Sacramento, and Warner Robins Air Materiel Areas.

San Antonio personnel expected the cocooning to begin at Kelly in August; but the contractors actually doing the work had fallen behind. Although cocooning began at Davis-Monthan and Pyote in December 1947, the work at Kelly never started. Contractors cocooned ninety-eight B-29s at Pyote and 455 at Davis-Monthan. But by January 1948, Air Materiel Command officials had become disenchanted with the project and cancelled the contracts in the spring as the Air Force began rebuilding its B-29 fleet. To make matters worse, later in the year, they found it was as difficult and time consuming to remove the cocoon as it was to put it on.

Despite high hopes, the cocooning program never met the command's expectations. However, San Antonio Air Materiel Area (SAAMA) workers devised another storage project during this same time period that did succeed. Instead of storing spare engines in wooden crates, Kelly workers began putting them in metal containers, a procedure which did not require special corrosion treatment for the engines and cost no more than crating. This simple, but highly effective procedure, worked.

Post -War Organizational Changes

San Antonio Air Technical Services Command marked the end of the war by implementing a new organizational structure called the T-system devised by ATSC during the war as the best way to manage an immense industrial wartime logistics organization. Knowing that one man could not control all of the complex, different functions managed by the command, Major General Hugh J. Knerr, ATSC Commanding General, created the positions of deputy commanding generals, technical to manage the various headquarters organizations, such as personnel, plans, intelligence, engineering, and supply. The result was bureaucracy at its best, providing a high degree of flexibility and responsiveness.

Air Technical Services Command began operating under this system in July 1945, and it went into operation at SAATSC on September 1. Since SAATSC was area headquarters, the system differed slightly from that at the headquarters; the functional managers were called "deputies" instead of deputy commanders and the Deputy for Intelligence was abolished as unnecessary for area commands. Initially, SAATSC had four deputies: Personnel (T-1), Engineering (T-3), Supply (T-4), and Plans (T-5). Based on a recommendation of Brigadier General George H. Beverley, SAATSC Commanding General (at that time depot area commanders held the same title as their superior at ATSC), ATSC agreed to the addition of a Deputy for Base Services (T-6) on January 29. To form the new office, the Base Services Division transferred from T-1 and the Air Installation Office moved from T-4. In addition to the offices of the deputies, SAATSC also had four independent staff offices: the Public Relations Office, the Air Inspector, the Judge Advocate, and the Adjutant General (today's Information Management Division).

After changing names four times in as many years, the San Antonio depot changed its name once again in 1946. On March 9, 1946, the Air Technical Services Command became the Air Materiel Command. To reflect the new name of its parent command, on July 2, the San Antonio Air Technical Service Command became the San Antonio Air Materiel Area (SAAMA), a name it would keep for the next twenty-eight years.

In 1947, Air Materiel Command modified the T-system, reducing the functions from five to three, to improve efficiency, reduce costs, and streamline operations. San Antonio Air Materiel Area instituted the resulting "Three Deputy" organization on July 27. Tested first at Oklahoma City and Mobile AMAs, the new structure consisted of Deputies for Administration, Supply, and Maintenance. The new Deputy for Administration combined the Deputies for Personnel (T-1) and Base Services (T-6), while the Deputy for Plans (T-5) became the Comptroller.

The concept called for the new deputies to operate to the greatest extent possible within the spheres of "pure" administration, supply, and maintenance, unencumbered by extra activities. Staff functions necessary to manage the base and the area, such as the Comptroller, Air Inspector, Public Information Office, and Technical Services Staff, reported directly to the deputy commanding general. Technical Services Staff, a new grouping of existing functions, consisted of technical advisors for the Army arms of service: Chemical, Ordnance, Signal, Transportation, and Quartermaster Corps; the Corps of Engineers; and the Finance and Medical Departments.

The "Three Deputy" organization was only in operation at Kelly Field for one month. On July 24, 1947, in preparation for "independence," Headquarters Air Force directed all its major commands to establish an "A-Staff" organization. Headquarters AMC told its AMAs not to reorganize at this time. San Antonio officers, knowing they would implement the "A-Staff" organization sooner or later, asked permission to put the new structure into effect quickly, which they received on August 5. On August 26, SAAMA, instituted the "A Staff."

In theory, under the "A-Staff" system, the chiefs of SAAMA's major offices held the various "A-Staff" positions as additional duties: the Chief of Personnel was appointed "A-1," Chief of the Airdrome served as "A-2," Chief of Maintenance acted as "A-3," and the Chief of Supply was "A-4." Independent staff offices reporting directly to the commanding general included the Comptroller, Air Inspector, Public Information Office, and Chief of the Hospital (formerly the Surgeon's Office). The new organization also removed the Judge Advocate, Adjutant General, and Chaplain from the Deputy for Administration and combined them with the Technical Services Staff to form the Technical and Administrative Services Staff. Like previous organizational systems, though, the "A-Staff" organization was short-lived.

By 1948, AMC had abandoned its earlier deputate organization in favor of directorates, which restored overall control of the command's policies and programs to the commander and allowed a needed degree of centralization. In turn, SAAMA adopted a two directorate system (Maintenance and Supply) on June 1, aimed at streamlining operations. The directorate system set up distinct lines between operational, administrative, and advisory functions. The reorganization eliminated the administrative staff offices as a separate group, combining this function with Personnel and the Judge Advocate, Adjutant General, Surgeon, and Chaplain, which lost their staff positions, to form the new Personnel and Administrative Office. Charged with physically running the base, the Base Executive assumed the functions of the Chief of the Airdrome. The Inspector General, Public Information Officer, and the new position of Comptroller served as the commander's personal staff. Basically, SAAMA kept this directorate system for the next forty-two years, adding and deleting directorates as needed.

Yes, Ma'am!

Bowing to the demands that women be allowed to serve their country, the Army organized the Women's Army Auxiliary Corps in May 1943. In less than four months, on September 1, the Women's Army Auxiliary Corps officially became a part of the United States Army and changed its name to the Women's Army Corps (WAC). Kelly's first WACs arrived less than a year after the auxiliary corps was first organized, led by Captain Rose E. Panowski, who reported to Kelly from Wright Field. Kelly's WAC detachment gradually grew until there were as many as 300 women in uniform. The detachment here was one of the first WAC squadrons in the Army Air Forces. In addition, Kelly Field had the first all-WAC weather station during the war. However, the WACs demobilized as fast as their male counterparts, and by 1946, only twenty WACs worked at Kelly. Their numbers dwindled gradually until only eleven remained. The last group of Kelly's WACs, Air Transport Command's flight traffic clerks, packed their B-4 bags and left the field early in June 1947. Although ATC's women-soldiers had only been at Kelly since 1946, they reminded the "oldtimers" of the WACs who brightened Kelly's scenery during the war.

LAST OF THE GIRLS IN KHAKI-Pretty Sgt. Bonnie Barron, one of the last WAC's to make their exit from Kelly Field, waves goodbye prior to boarding a C-54 enroute to her new station. Approximately 200 WAC's were stationed on Kelly at the height of the war. Today, the striking brunette sergeant is the last of a group of eleven enlisted WAC's shipping out to new stations.

Operation "CROSSROADS" called for the modification of B-17 bombers as remote controlled drones. These planes would fly in close proximity to atom bomb blasts gathering scientific data.

Supporting New Missions

While the Army Air Forces demobilized at breakneck speed, it faced certain realities which shaped its future: the reality of an independent Air Force, the division of Europe into two enemy camps, and the atomic bomb. While much of Kelly's energy was directed at the immense effort involved in dismantling the machinery of war, an increasingly large portion of the field's personnel began working on projects that reflected those post-war political realities. By late 1947, aircraft left Kelly's storage fields as fast as they entered as the Air Force outfitted new Air National Guard units with P-51s, sent AT-6s to Air Training Command for more pilot training, and filled out its forces to reach the goal of fifty-five groups by the end of the year.

Operation Crossroads

With the dropping of the atomic bombs on the Japanese cities of Hiroshima and Nagasaki, air power emerged as America's first line of defense and primary force of deterrence. But at this point, atomic power was largely an unknown force; knowledge had to be acquired--and fast.

On February 5, 1946, ATSC notified Kelly officials they would work on a project of national importance -- the modification of B-17 aircraft to participate in nuclear weapons testing in the Pacific. By the time the first B-17 arrived at Kelly on February 10, Maintenance officials already had devised a general plan of action. Work started immediately on the mock-up of the aircraft that would fly through the atomic bomb blast. The modified, radio-controlled B-17s were called "babies," while those that would control them were nicknamed "mothers."

Kelly's plan divided the sixteen B-17s into two groups: employees worked the six mother aircraft separately from the ten babies. Workers modified the mother ships to fly the babies by remote control, one baby ship to each mother B-17, with four other babies as replacements. The B-17 mothers soon bristled with antennas that sent out and received electronic "beeps." Transmitters sent out signals to fly the babies and control instruments on board. With television receivers, pilots and scientists in the mother ships could see what was happening in the area the babies flew over and could check instruments installed on special panels in the remote controlled B-17s to see how they responded to instructions. Receivers also allowed pilots in the mother aircraft to keep track of their babies, flying over forty miles away. Kelly maintenance workers also devised an intricate interphone circuit to ease coordination between crew members on the mother ships.

Baby ships presented a whole different set of problems to Kelly's maintenance craftsmen. The B-17s had to remain standard enough to be flown normally by a regular crew and yet had to be able to take off, fly, and land without a crew. While aircraft had taken off and landed by remote control before, none had ever landed without a crew aboard. And these "babies" had to land undamaged. Workers installed small motors to operate brakes, throttles, and a special automatic pilot. Gears had to be raised and lowered, ignition cut off, and in-flight altitude controlled. Many miles of wire and terminal strips were used to fly these aircraft without a crew.

Maintenance workers installed the desired modifications from drawings, photographs, and instructions technicians from Wright Field, Ohio, brought with them. The intimate knowledge Kelly personnel had acquired after years of working on B-17s helped, too. They installed huge bags in the bomb bays to collect air samples, put in cameras to record conditions around and under the "babies," and installed geiger counters to register levels of atomic radiation. Wires, circuits, and other equipment were ground checked, and the aircraft were then test flown.

As the project neared completion, a fire occurred in the cockpit aboard one of the B-17s. A relocated windshield wiper circuit breaker rubbed against a hydraulic gauge line. The cockpit burst into flame, but workers extinguished the blaze before firemen arrived. Since no one wanted the burned plane to delay completion of the project, supervisors rolled up their sleeves and joined the workmen removing fire-damaged parts and wires. Taking parts off another B-17 in storage and working ten-to-twelve-hour days, workers finished the burned B-17 in time for this "baby" to join the others.

To show their appreciation for the hard work and long hours Kelly personnel had put in to complete the B-17s on time, Operation Crossroads project officers arranged for the workers to go on a demonstration flight in orange-and-black-banded mother and baby ships. The baby had a crew on board for safety reasons, but they kept "hands off" as it zoomed and circled around the field. On March 22, 1946, Kelly's last Crossroads aircraft left to train its crews. Everyone at Kelly cheered when they learned of the babies' and mothers' successful performances at the atomic bomb tests over Bikini Island.

P-80 Project

While German pilots flew jet aircraft in combat in 1944, the first American jet, the P-80 "Shooting Star," did not arrive at the tactical units until December 1945. While several different jet aircraft became operational between 1945 and 1948, they were still a rare breed to the workers at the San Antonio depot. Kelly was introduced to this new type of aircraft in March 1946 when its workers got the job to modify and change the engines on twenty-five P-80 "Shooting Stars" grounded at Love Field, Texas.

Since none of the Kelly workers had ever seen, much less worked on, a jet aircraft, this was indeed a test of their talents. A crew went up to Love Field and set up shop in a "borrowed" hangar from the former Lockheed Modification Center where they ran into several obstacles. Workers had to track down P-80 peculiar support equipment (things like mating cradles, engine slings, and engine stands) that were not available at either Kelly or Love Fields. While replacing J-33-11 turbojet engines with J-33-9 engines, crew members discovered the engines had fallen out of the mounts inside the crates during shipment. They had to photograph the engines to document the damage and write up reports on the faulty mounts. Once these

The first jet Kelly mechanics had a chance to work on was the Lockheed P-80.

things were taken care of and the damaged engines exchanged for good ones, workers installed elevator counter balance weights, replaced studs and hooks in the main landing gear door operating mechanism, relocated the engine fuel vent lines, and performed a fifty-hour inspection. The team completed, test flew, and delivered the twenty-five P-80s after only 245 manhours per aircraft. Kelly's first introduction to jet aircraft ended successfully.

The first jet aircraft, also a P-80, repaired at Kelly entered SAAMA's shops in June 1947. When it made a wheels-up landing at Biggs Field, Texas, a team from Kelly went to El Paso, took the jet apart, sent the engine to Wright Field in Ohio, and trucked the P-80 to Kelly where workers repaired the landing gear and fuselage and installed a later model J-33 engine. Colonel Frederick A. Bell, SAAMA's new Deputy for Maintenance, flight tested the jet on September 19, accurately predicting that the old reciprocating engines would soon disappear from Kelly's flight line.

Air Depot Training

In 1946, SAAMA picked up a mission that reminded depot old-timers of the war years. In April, Headquarters AMC notified Kelly that it would become the command's centralized training center for air depot groups and service teams. Headquarters AMA chose Kelly because of its centralized location, suitable climate for year-round training, and good air and rail connections. In addition, the south Texas base had adequate housing and training facilities readily available. The new program, scheduled to run between June 1946 and January 1947, would train approximately 12,000 men to supply and maintain aircraft, motor vehicles, and other pieces of Air Force equipment.

Most of these military personnel would man three newly-formed air depot groups: the 16th, 59th, and 86th. When fully manned, 1,676 personnel would be assigned to each air depot group. Other soldiers would form signal radio maintenance teams where they would learn to install, maintain, and repair airborne and ground radar and radio equipment for deployment around the world. Still others would receive training in salvage, corrosion control, and moisture-and-fungi-proofing operations. Kelly transferred men from the 4121st Army Air Force (AAF) Base Unit (Area Command), home for the base's military personnel, to the 4505th AAF Base Unit (Training) to train the air depot groups.

The 16th Air Depot Group transferred to SAAMA the first of May 1946. San Antonio AMA officials assigned personnel from the 16th to the 59th Air Depot Group since it had to be manned and ready for training by July 1. Fully trained, the 59th received its first mission in April 1947--putting the 1,500 P-51s and A-26s stored at Hobbs Army Airfield, New Mexico, in top condition to be flown out and then closing the air field.

With eighty percent of its personnel tuning engines and cleaning, repairing, and ground testing the aircraft, the 59th flew the last A-26 out of Hobbs the first week in November, five months ahead of schedule. With its mission at Hobbs complete, the 59th moved to Rome Air Depot, New York, on January 22, 1948. Hobbs Airfield transferred from SAAMA to the District Engineers on May 8th.

As the 59th moved to Hobbs in the spring of 1947, SAAMA was training the men of another air depot group, the 86th. Although its squadrons were only partially manned, the 86th moved to Rome Air Depot on September 19th for three months temporary duty. Completing its assignment one month ahead of time, the 86th returned to Kelly on December 7th.

Independence!

By the end of the war, it was a forgone conclusion that the Air Force would finally become independent; the main effort was creating a single, unified military department. All through 1946 work continued on what became the National Security Act of 1947, which provided for three military departments--the Army, the Navy, and the Air Force--and a united Department of Defense to coordinate national security matters. On September 18, 1947, W. Stuart Symington became the first Secretary of the Air Force. General Carl Spaatz, one of the first four pilots to land at Kelly in April 1917, was sworn in as the first Chief of Staff, United States Air Force, on September 26. The forty-year-old relationship with the U.S. Army ended, and a new era in which air power served as the nation's first line of defense began.

On September 18, 1947, the United States Air Force officially became a separate branch of the military.

In July 1947, facing fiscal reality that prevented the organization of seventy groups as they wished, Air Force leaders adopted a plan to organize and man fifty-five operational groups by Christmas. Of these fifty-five groups, nineteen would be bombers, twenty-eight fighters, and eight transport groups.

With independence, the tempo at Kelly quickened. On August 8th, SAAMA received orders to process aircraft, vehicles, aircraft accessories and other types of material for the 55 Group Program by December 20. In September and October, San Antonio Air Materiel Area added between 1,100 and 1,200 new employees to meet this December deadline. Kelly workers took 350 aircraft out of storage and prepared them for delivery: 286 P-51s, fifty B-29s, eleven L-5s, and three F-13s (the photo-reconnaissance version of the B-29).

In late November, the Air Force announced even more aircraft would be pulled from storage to flesh out the fifty-five groups; Kelly's storage fields were scheduled to lose fifty more B-29s and 300 fighters. In addition, Kellyites processed and repaired over 500 stored vehicles and 1,300 engines, and shipped twelve million pounds of equipment for the program. By working ten and twelve hours a day and weekends, SAAMA personnel met their deadline.

In 1948, Air Force installations dropped their Army titles and officially became Air Force Bases (AFB). On January 29, after thirty-one years as Kelly Field, the south Texas flying field became Kelly Air Force Base.

Support of Global Operations

The Berlin Airlift

After the end of World War II, relations between the former Allies quickly soured as Communists grabbed power in Eastern Europe. Completely encircled by the Russian Zone of occupied Germany, Berlin soon became a symbol of tremendous importance for both the East and the West. Attempting to drive American, British and French forces out of the city, the Russians placed restrictions on all rail, barge, and road traffic into the western sectors of Berlin, stopping it completely by June 22, 1948. West Berlin was isolated. The Allies had a choice: they could either withdraw all of their forces, abandoning Berlin to the Russians, or supply all the necessities of life for the military community and two million Germans by air. The Allies chose to stay and "fight." On June 26, the first flights of the airlift landed at Berlin's

Major General Clements McMullen

For over thirty years, the personal history of Clements McMullen and the public history of Kelly Air Force Base were intertwined. McMullen became a flying cadet in September 1917, earning his wings on March 6, 1918. Upon receiving his commission, he went to Kelly Field to enter the School for Instructors before moving on to Gerstner Field in Louisiana as a student in the pursuit course and instructor in combat flying. In July, he became the officer-in-charge of flying at the Gunnery School at Rockwell Field, California. After a year in California, Lieutenant McMullen joined the 90th Aero Squadron at Eagle Pass, Texas, for border patrol duty. Between January 1921 and July 1922, McMullen served as the Assistant Engineering Officer at the Montgomery Intermediate Air Depot in Alabama and officer-in-charge of the Machine Shop and Motor Tests at Carlstrom Field, Florida. In July 1922, he took command of the 62nd Service Squadron at Brooks Field, Texas, before moving across the city to serve as Engineer Officer of the San Antonio Air Intermediate Depot at Kelly in September 1924. After spending two years in the Philippines (1926-1928), he returned to the States to attend the Air Corps Engineering School at Wright Field, Ohio. Upon graduation in June 1929, he was assigned to the Experimental Engineering Section there at Wright Field.

In September 1933, Captain McMullen entered the Air Corps Tactical School at Maxwell Field, Alabama. He remained at Maxwell after graduation, and it was during this time that McMullen became one of the founding members of the Order of the Daedalians, a group of American World War I pilots dedicated to ensuring that the United States would always be first in air and space. From Maxwell, McMullen went to Langley Field, Virginia, to work at the General Headquarters, Air Force. In August 1937, Major McMullen entered Command and General Staff School in Kansas and, upon graduation, went to Duncan Field as the Engineering Officer of the San Antonio Air Depot and then commander of the depot.

He remained at Duncan Field until January 1942, when he took command of the 3rd Air Service Area Command in Atlanta, Georgia. After serving in Washington, D.C. for two years and entering the ranks of general officers, now-Major General McMullen went overseas to take command of the Far Eastern Air Service Command in September 1944. After the war, he served as Chief of Staff of the Pacific Air Command. In November 1946, he assumed command of the newly reactivated Eighth Air Force at Fort Worth, Texas.

General McMullen received a new assignment in January 1947 as Deputy Commanding General of Strategic Air Command, a position he held until October 1948 when he, once again, returned to Kelly as Commander of the San Antonio Air Materiel Area. General McMullen commanded Kelly and SAAMA until February 28, 1953, when he retired after 36 years of dedicated service.

Tempelhof Air Base with eighty tons of milk, flour, and medicine. Kelly's first shipment of supplies for the airlift left on June 30. Operation Vittles was on.

Thousands of flights into Berlin followed, with aircraft landing or taking off at three minute intervals, twenty-four hours a day, in all types of weather. The prime workhorse of the Berlin Airlift was the C-54 "Skymaster." Of the 400 C-54s in active service, 319 flew in the airlift. With its 14,000-pound cargo capacity and four R2000 reciprocating engines, the C-54 ferried ton after ton of food, coal, and other supplies to the beleaguered city.

Kelly Air Force Base played a key role during the Berlin Airlift, supplying over 15,000 items of equipment, ranging from radio sets to all types of ground vehicles (such as refueling trailers, fire trucks, and cranes), and from tiny nuts to whole fuselage sets. Kelly was the only depot in the nation turning out R2000 and R4360 replacement engines, the powerplants used by the aircraft flying the airlift. By December 31, the Supply Division had shipped 1,317 R2000 engines worth $19 million and thirty-four R-4360 engines worth $1.7 million for the airlift.

Requirements for Operation Vittles increased the level of activity in the Directorate of Maintenance to its highest level since World War II as Kellyites worked to provide a steady stream of replacement engines for Europe. Production schedules increased, overtime was used extensively, and second and third-shift operations were initiated as needed. Headquarters AMC authorized Kelly to hire more than 400 new workers, the bulk of whom went to the Engine Repair Section. Other sections "loaned" employees to work on the engines. More than 1,800 technicians, working in two eight-hour shifts, turned out R2000 and R4360 engines. Kelly's engine production more than doubled. By June 1949, engines valued at $50 million had left SAAMA shops.

Hollywood came to Kelly when film crews visited the San Antonio Air Materiel Area engine shops to film R2000 engines being overhauled for Operation Vittles.

A C-54 aircraft passes over the mobile ground control radar as the aircraft takes off from Rhein-Main Air Base, West Germany, on its way to Berlin.

But Kelly workers turned out other things for Operation Vittles as well. Mechanics rushed work on twenty-five C-54s by November, preparing them for flying conditions in Germany during the winter months. Spark plug production increased from 350 a day in July to 14,000 a day eleven months later. The Air Force's only chrome-plating plant and rubber plant were in operation around the clock. Kelly shipped out an additional $7 million worth of material for the aircraft flying the airlift.

By May 1949, the Soviets realized they had underestimated the Allies' ability and resolve to defend West Berlin. Their blockade ended May 12th, although the Allies continued flying in supplies until September 30 when reserve stocks in Berlin reached satisfactory levels and the international situation clarified. In fifteen months, Operation Vittles delivered over 2.3 million tons of food, fuel, and supplies to Berlin, proving beyond a shadow of a doubt that anything within reason could be moved by air anywhere in the world. Without a doubt, Operation Vittles was a victory for the Allies in the Cold War.

Kelly Integrates

On July 26, 1948, President Harry S. Truman signed Executive Order 9981, directing the armed services to foster equal opportunity. This was the catalyst the Air Force needed to desegregate. All Air Force leaders agreed segregation was inefficient. As General Carl Spaatz, Air Force Chief of Staff, wrote in April 1948, "It is the feeling of this Headquarters that the ultimate Air Force objective must be to eliminate segregation among its personnel by the unrestricted use of Negro personnel in free competition for any duty within the Air Force for which they may qualify."

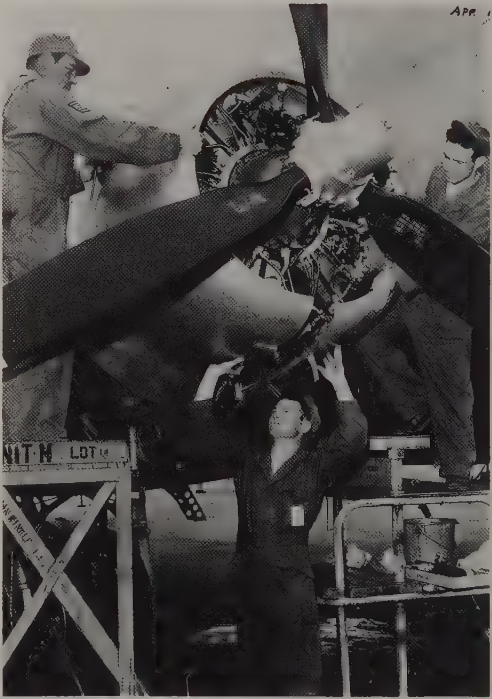
Kelly's 341 enlisted black airmen had been assigned to the all-black 3050th Air Base Support Squadron. With desegregation the official Air Force policy, Kelly's military leaders began integrating blacks into all-white squadrons during the summer of 1949. During July, officials interviewed the black airmen in preparation to reassign them to other units. Over 200 of Kelly's blacks were sent to other bases with vacancies in their specialities. All remaining black personnel were assigned to Headquarters and Headquarters Squadron SAAMA, starting with three men in August and followed by another 107 on September 25. With integration of black airmen complete, AMC discontinued the 3050th Air Base Support Squadron on October 5, 1949.

Despite fears to the contrary, no major indication of racial friction appeared at Kelly after the integration policy went into effect. When blacks first moved into the "Palace" (airmen's living quarters), military officials placed the blacks in separate sleeping rooms. Gradually, officers moved blacks into white areas and whites into black areas. Change was made slowly, with gradual contact and adjustment for both races. When any problems occurred, the commanding officer took a firm position, supporting the integration policy. A few potential cases of insubordination to black noncommissioned officers arose, but officers put a stop to these immediately. Although most were skeptical that integration would work, Kelly's efforts in 1949 showed that blacks and whites could live and work together.

The Korean War

By the summer of 1949, activities at Kelly were beginning to settle back to their pre-airlift tempo. The Engine Repair Section, which had been operating with 1,800 workers and two shifts, went back to one eight-hour shift and released its extra personnel. Top priority went to the R4360 engine as more B-36s entered the Air Force's active inventory. Managers suspended overhaul of R2000 engines, which had been a top priority since 1946. The huge XC-99, the largest aircraft in the free world, thrilled San Antonians as it flew in and out of Kelly. Life was returning to normal in south Texas.

But halfway across the world, tensions were increasing. During the predawn hours of June 25, 1950, North Korean soldiers attacked across the thirty-eighth parallel, the line which divided the communist North from the democratic South, in an act of raw aggression. On the afternoon of June 25 (June 26 in Korea), the United Nations (UN) Security Council called on the North Koreans to withdraw to the thirty-eighth parallel. The North Koreans responded by intensifying their attack. During the evening of June 26, President Truman directed General Douglas MacArthur, Commander of the Far East Command, to use the American military to support the South Korean army. The next day, the UN Security Council called for the members to assist the



With the coming of war in Korea, C-47s previously placed in "mothballs" were pulled out of storage, reconditioned, and put back on active duty.

Republic of Korea to repel the attack and restore peace and security to the area. On June 30, Truman authorized air attacks against North Korea and the use of American ground forces to stop the attack.

Military installations across America responded quickly to the fast-moving war in a land many Americans had never heard of. On June 28, Headquarters AMC initiated Project Hold-Off, authorizing the highest priority for shipment of items to the Far East. Supply personnel, working two shifts seven days a week, processed and shipped requests destined for the Far East Air Forces within twenty-four hours of their receipt. Kelly Supply employees processed 63,263 line items in August alone, fifty to sixty percent of AMC's Project Hold-Off work load.

Just before the 4th of July holiday, Air Materiel Command notified SAAMA its Maintenance shops had to prepare twenty-two B-26 "Invaders" for combat. Summer vacations were forgotten. The first B-26 arrived at Kelly on July 4; the last left on schedule on July 9. To meet this tight deadline, SAAMA mechanics worked around-the-clock. As American airmen rushed to the Korean peninsula, depot workers pulled thousands of aircraft out of storage.

Major General Clements McMullen welcoming back Mrs. Gertrude Threadgill, the first of the women war workers of World War II, known as "Kelly Katies," who returned to the old job she held from 1941 to 1945, that of an aircraft parts patternmaker.

All-Out Mobilization, All-Out Sacrifice

To All SAAMA Personnel:

These are troubled times. The next few months will be a very vital period in American history; they may well determine whether we live as free men and women or as slaves.

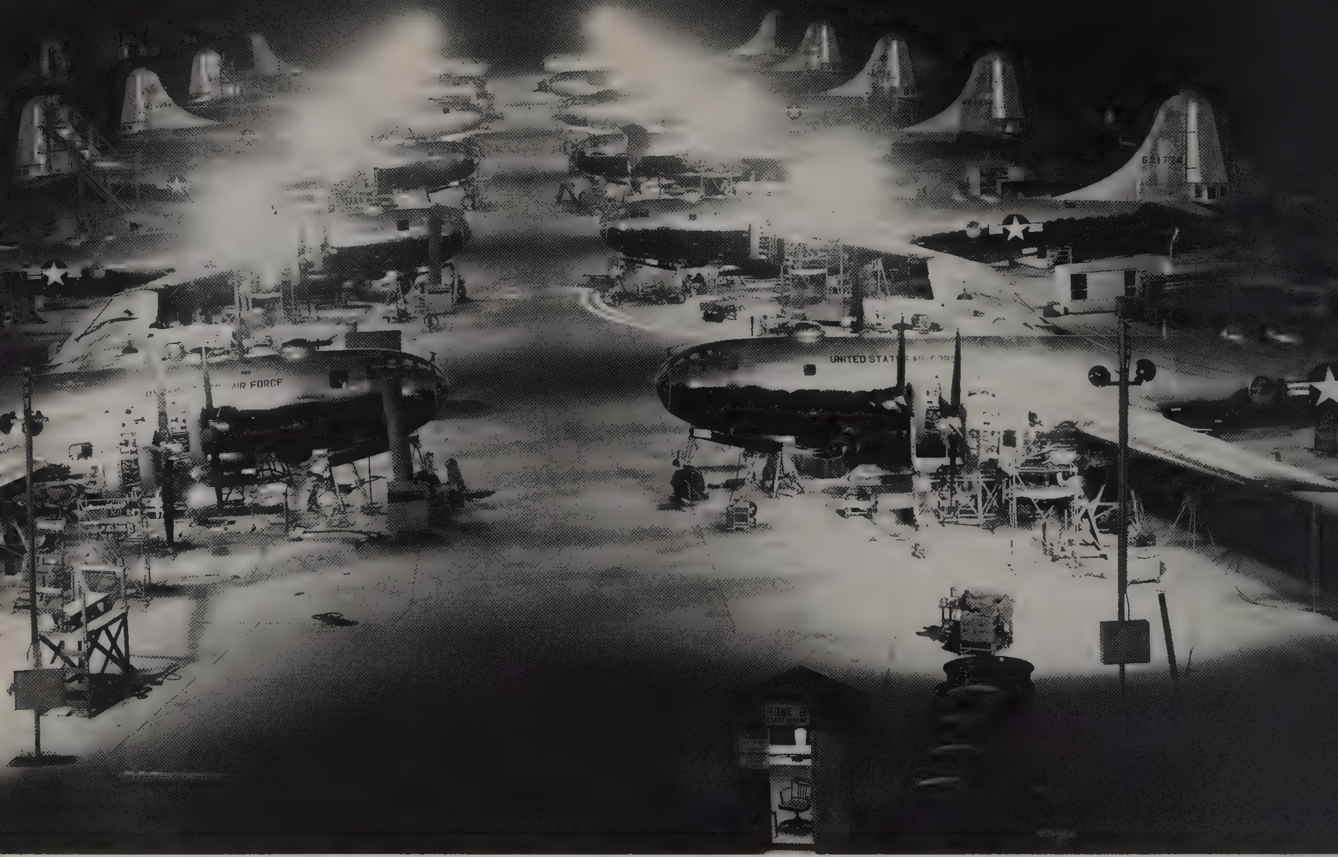
To maintain our freedom, American industry, military and civilian, has been ordered to mobilize its forces for peace. This will mean longer working hours, harder work, and ever-increasing sacrifices on the part of all Americans.

As part of American industry, Kelly AFB has a key spot in this mobilization. Our work loads and production quotas will increase. Even now many of us are working long hours six days a week to rush vital projects to quick completion. In the near future more and more of us may be called upon to work longer hours, to help step up production. Such a program will naturally necessitate sacrifices on the part of all of us. These sacrifices are the privilege of only a democratic people.

In short, we are now confronted with our biggest job since the end of World War II. We must do our work faster and more efficiently if America is to be prepared to defend its freedom--our freedom.

God grant that we may do this job with the same determination and courage as that being displayed by American youngsters on the battlefields of Korea.

Clements McMullen
Major General, USAF
Commanding



The B-29 outdoor production area, known as the "Great White Way," allowed for around-the-clock maintenance of the big aircraft.

On July 1, 1950, 2,029 planes, mainly AT-6s and F-51s, rested between Kelly's runways. Six months later, only 1,389 aircraft remained; all but thirty-nine F-51s were on their way to operational forces. Kelly's personnel rolls swelled; the number of workers in the Maintenance Division jumped from 6,620 to 8,011 by December 1950.

Production schedules increased. Maintenance employees worked around-the-clock once again. Between June and November 1950, these workers put in a total of 1.1 million manhours to meet the increased demand for aircraft, equipment, and accessories. In the Engine Repair Section, an urgent need existed to increase production of the giant engines for the B-36. The requirement for vehicles and powered ground equipment was just as great. Kelly's maintenance shops were in high gear.

As in the closing days of World War II, the B-29 was in great demand to bomb targets deep within North Korea. To bring Strategic Air Command's bombardment groups to full strength, B-29s came out of storage. During the day, aircraft mechanics overhauled B-29s under huge umbrellas to help block out the searing summer sun. During the night, electricians rigged special outdoor lighting to illuminate the planes lining both sides of the ramp. Reflector lamps on drop cords were arranged so one hung over each engine of the plane being repaired. The B-29 production line next to building 324 earned the nickname "The Great White Way" as the reflected glow of lights shining on the aluminum skin of the bombers lit up the evening sky.

For two months mechanics worked on "The Great White Way," which earned a great deal of national publicity, but a better method was needed. To improve efficiency and put everyone on one shift, Maintenance officials replaced it with an improved production line that operated under the principle of bringing the work to the mechanic rather than moving the mechanic to the work. The huge thirty-two work station aircraft overhaul line extended for more than a mile. It could handle any aircraft in the Air Force inventory except the mammoth B-36. To make the line adaptable to different sized aircraft and keep the work flowing smoothly, workers processed large planes like the B-29 in single file. Smaller ones like the AT-6 and F-51 went through the overhaul line in pairs. A radio telephone system and loud speakers were installed so personnel could communicate between work stations. Four parts trains, dubbed the "Maintenance Express," delivered supplies and parts eight times a day to fifty different places along the overhaul line.

Two-Zone Support System

Organizationally, AMC and its depots were better prepared than they were for the start of World War II. In 1948, in an effort to streamline storage and distribution procedures, AMC eliminated the specialized depots and area depots that served a number of bases within a small geographic area. In their place, the command divided its responsibilities into two zones: the eastern zone served Europe and those bases east of the Mississippi River while the western zone served the Pacific and bases west of the Mississippi. Each zone had depots for the supply and maintenance of each property class. Material flowed from the manufacturer direct to the appropriate zonal depot. Prior to the two zone--or bi-zonal--system, SAAMA maintained approximately 165 property classes and sub classes. With the two zone system, its workers specialized in fifty-four property classes. Obviously, as work load in some maintenance sections grew, it shrank in others; for example, Kelly managers expected an increase in instrument work, but a substantial decrease in landing gear and sheet metal work.

By December 1950, it was clear to everyone that the police action in Korea would not end soon. On December 16, President Truman declared a state of national emergency. Headquarters AMC gave the AMAs authority to institute a forty-eight hour work week when the work load required it. Thousands of men were drafted or recalled to active duty. Kelly lost 720 civilians to the Armed Forces between January and June 1951; however, SAAMA gained 5,313 civilian authorizations during the same six-month period. New hiring during this time frame was the most rapid build up in strength since the first part of 1942, shortly after the outbreak of World War II.

Under the "Two-Zone" support system, San Antonio Air Materiel Area assumed responsibility for the B-36 "Peacemaker," the nation's first truly global deterrent force.

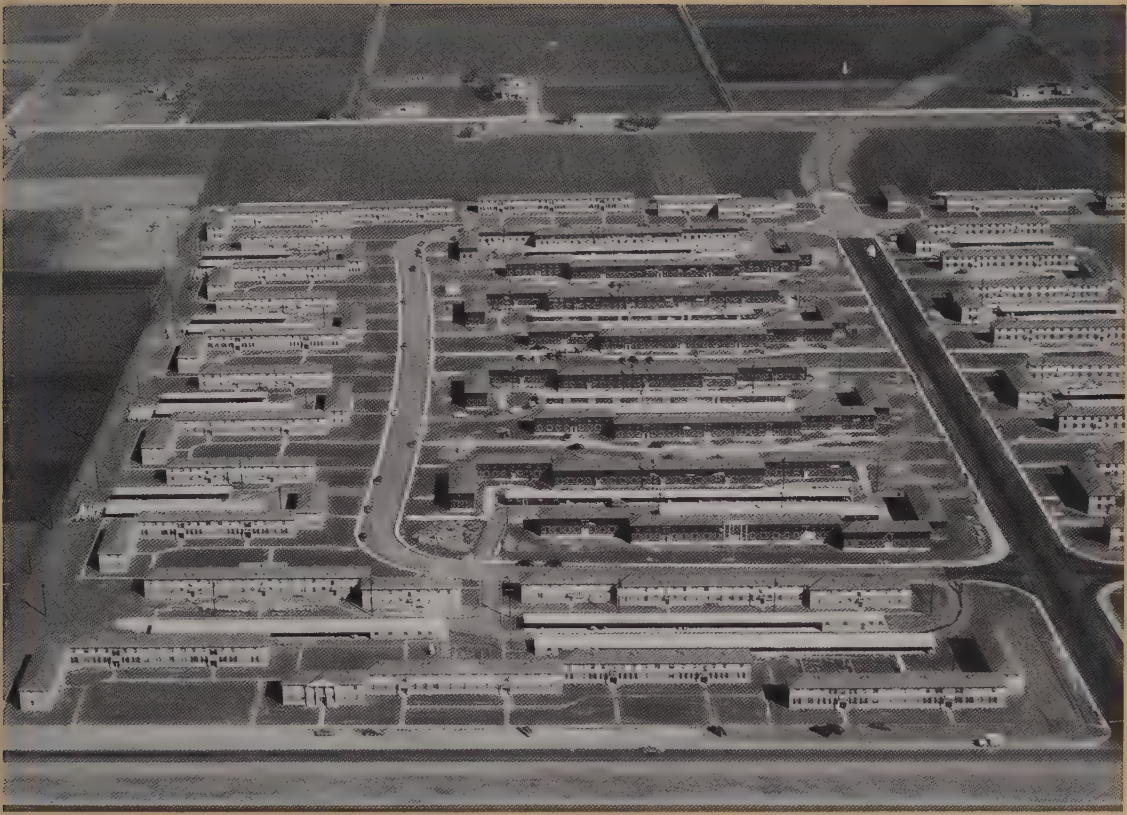
"Kelly Katies" doing desealing work in a B-36 fuel tank during the Korean War.

Many of the "new" workers hired were "Kelly Katies," who returned to the lathes and welding masks they left at the end of World War II. On June 30, 1950, only 1,573 women worked at Kelly; a year later, 3,297 women were on the base's payrolls. Seven hundred of them worked in Maintenance. As an article in the base newspaper, The Flying Times, rhapsodized, "And this time, Katie doesn't have to prove herself. She was one of almost 10,000 gals who kept planes and material rolling out of the nation's biggest air depot in [World] War II."

With all of these new employees, Kelly had to start a massive training program. Most training started within the organizations themselves as experienced workers taught the new employees their jobs. The "old timers" generally started the newcomers on simple jobs on the production line, before moving on to more complex jobs that required extensive classroom training. Two hundred and forty-four existing workers went into Kelly's Apprentice Training Program after the Korean War started to meet the increased demand for skilled craftsmen. These indentured apprentices trained in ten different trades, such as aircraft radio and radar technician, aircraft engine mechanic, aircraft electrician, and aircraft service mechanic.

For over three years, Kellyites overhauled aircraft and engines and shipped supplies halfway around the world to support the air forces in Korea. In addition to the war work, SAAMA gained new responsibilities as the headquarters decentralized. Its personnel strength peaked in December 1952 when 23,463 employees reported to work daily, more than at the height of World War II.

While the police action in Korea officially ended on July 27, 1953, American forces did not draw down as fast as they had after previous wars. Americans relearned the old lesson that the price of peace is eternal vigilance. The Cold War was far from over.



Billy Mitchell Village

Early in 1949, the Southwest Construction Company, backed by a New York insurance company, announced plans to build military family housing for Kelly and Lackland Air Force Base personnel on an eighty-six acre tract of land at the corner of Lackland and Frio City Roads. This four million dollar project followed the Air Force policy of encouraging private capital to build military housing in areas where housing was in short supply. Faced with a serious housing shortage for its enlisted personnel, Kelly officials enthusiastically supported the project. Since the area was still outside San Antonio's city limits, the Air Force agreed to provide some essential services to the project such as water, sanitary sewage, and raw sewage lines. By June, the Federal Housing Administration had approved construction of 408 one-to-three bedroom brick apartments. The construction company also planned to build a two-acre community center for the model "town." Officials of Kelly, Lackland, San Antonio, and the Billy Mitchell Corporation attended groundbreaking ceremonies at Kelly's front gate on August 2, 1949.

In November, Kelly learned the Air Force approved construction of an additional 592 units under the Wherry Housing Act, bringing the total up to 1,000 new apartments and making Billy Mitchell Village the largest military family housing unit in the nation. Rental rates for the new apartments were very reasonable. Airmen paid $52.50 a month for a one bedroom apartment, $65.00 for two bedrooms, and $72.00 for a three bedroom apartment. Rates for officers were slightly higher ($65.00, $80.00, and $90.00, respectively).

On December 16, Assistant Secretary of the Air Force Eugene M. Zuckert and other Air Force and city dignitaries attended dedication ceremonies for Billy Mitchell Village. Although Assistant Secretary Zuckert cut the ribbon, officially opening the Village to the public at this time, the apartments weren't available for rent until July 1950, and Kelly and Lackland people quickly moved in.

While Billy Mitchell Village housed Kelly military families, the base didn't own the complex. This changed on March 1, 1960, when, under provisions of the Wherry Housing Act of 1959, Kelly acquired 592 units in Billy Mitchell Village. At the time, base officials had neither the money nor the inclination to buy the remaining units when offerred.

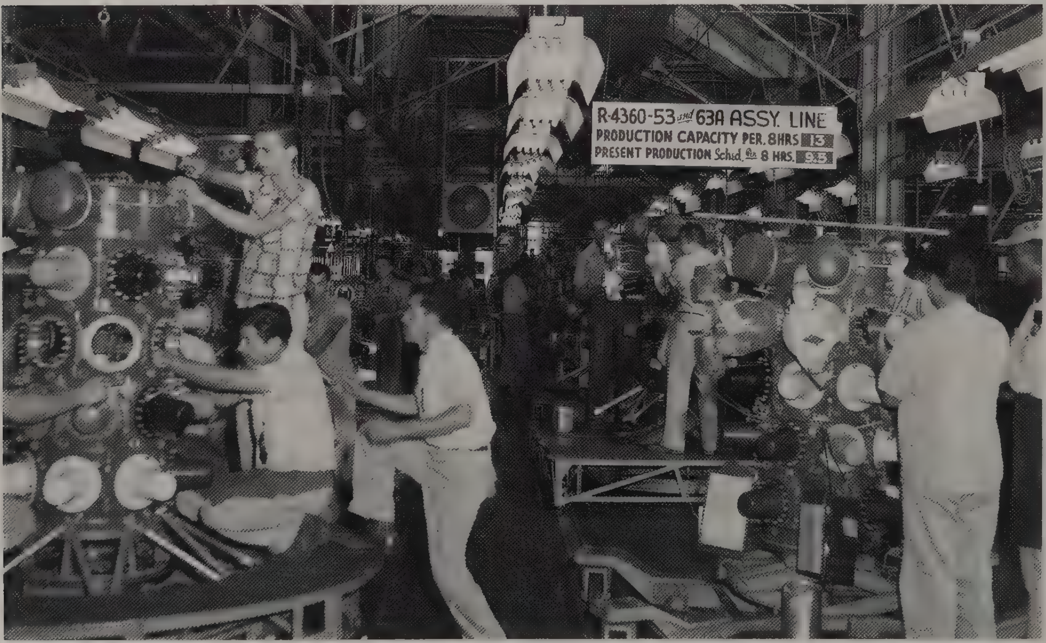
The Big Show

The B-36 Mission at Kelly

Faced with a war on opposite sides of the world, the United States Army Air Forces ordered a long range, heavy bomber from Consolidated-Vultee in 1941. Development of the B-36 was slow, however; the new bomber did not make its maiden flight until August 1946. Nicknamed the "Peacemaker" because of its deterrent effect, the B-36 could deliver nuclear weapons to any place in the world. Its six 3,000-horsepower R4360 engines "pushed" the giant bomber at a maximum speed of 410 miles per hour.

Kelly's first association with the B-36 came through the Pratt and Whitney R4360 engines. Named as the only maintenance depot for these huge powerplants, SAAMA managers began planning for the new work load late in 1946. While the first R4360 did not roll off Kelly's engine overhaul line until August 1948, the intervening years were not wasted. Workers spent the time projecting how many spare parts (like carburetors, magnetos, and wiring harnesses) would be needed; constructing build-up stands; retooling; and putting test facilities in order. This grace period facilitated a smooth transition from overhauling smaller engines to the most powerful engine of its time.

The first B-36 aircraft repaired at Kelly arrived on August 30, 1948, from Carswell AFB near Fort Worth, Texas. While workers fixed damaged bomb bay doors and made other repairs, they took the opportunity to study the bomber at close range. Knowledge gained from this visit was put to good use; in September 1949, SAAMA joined Oklahoma City AMA as a specialized repair depot for the B-36, marking Kelly's entry into the big airplane overhaul business. By 1951, B-36 "Peacekeepers" had been arriving at Kelly in ever increasing numbers. In June, SAAMA "swapped" its responsibilities for the B-47 "Stratojet" to Oklahoma City AMA for all the B-36 work load in the western bi-zonal area. Since Kelly already overhauled all R4360 engines and served as the B-36 propeller repair point, it made sense for SAAMA to assume full maintenance responsibility for the aircraft. In January 1952, Aircraft Repair Branch workers stopped overhauling all other aircraft, concentrating totally on the B-36. Work on the "Peacemaker" moved to the now famous Kelly production line in back of building 324.


R-4360-53 and 63A ASSY. LINE
PRODUCTION CAPACITY PER. 8HRS 13
PRESENT PRODUCTION Schd. Per 8 HRS. 9.5

Production of the R4360 engine would be Kelly's largest engine work load until the arrival of the F-100 jet engine in the mid '70s.

In the spring of 1952, Headquarters AMC instituted a massive decentralization program (to be discussed later in this chapter), delegating worldwide responsibility for assigned classes to the prime depots. San Antonio AMA assumed complete responsibility for the property classes dealing with Convair aircraft -- the B-36 and XC-99. In addition, Kelly workers became responsible for all major repair work for crash-damaged B-36s, including going to the crash site and preparing the giant bomber for a one time flight to Kelly for major repair.

Project SAM-SAC

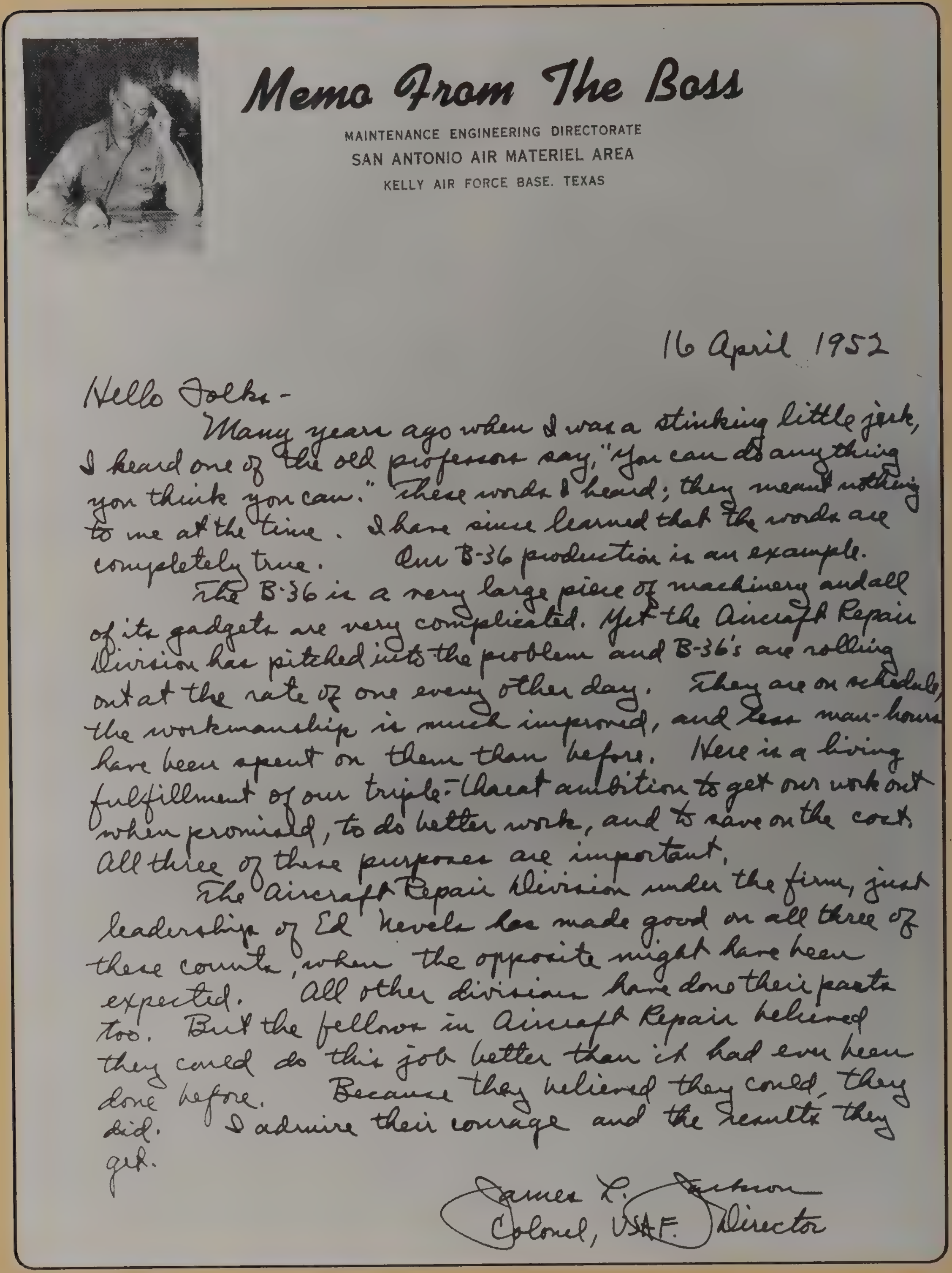
As prime depot with complete responsibility for the B-36, SAAMA began managing various modification programs for Strategic Air Command's (SAC) first line bomber. One of these was Project SAM-SAC, or specialized aircraft maintenance for the Strategic Air Command. This huge modification program called for the modernization and standardization of the B-36 fleet over the course of six years. Although employees at Consolidated-Vultee Aircraft Corporation at Fort Worth, Texas, performed the actual work, SAAMA workers managed the program. It was the first time in Air Force history an air depot controlled a program of this size and scope. In March 1953, C. S. Dougherty, civilian chief of SAAMA's Command Work Load and Control Office, signed the initial $15 million contract, believed to be the largest contract ever signed by the San Antonio depot up to that time. Work on the first B-36 began on April 1, 1953; SAC accepted it on 30 July.

Because the project was so large, SAAMA managers broke it into phases or cycles (in the parlance of the day). Cycle I encompassed the progressive disassembly, inspection, and repair of the B/RB-36 fleet. Consolidated-Vultee workers reconditioned the tail section and wings, including the engine nacelles and jet pods. A total of 361 B-36s went through Cycle I by its end in February 1957. Cycle II, which ran from April 1955 to April 1957, completed the modification project. Only 146 of the propeller-pushed bombers went through Cycle II because of the accelerated phase out of the B-36. Air Force leaders decided only those B-36s scheduled to remain in the tactical inventory for at least one year would be modified and repaired. Total costs for Project SAM-SAC reached $156 million.

B-36 Maintenance Stands

A problem arose early in 1955 concerning B-36s that had been used in atomic tests in the Pacific. The induction of these radioactive contaminated aircraft into the Fort Worth plant naturally concerned Convair officials (Consolidated-Vultee Aircraft Corporation became Convair, a division of General Dynamics, in 1954). While no one knew these aircraft were contaminated beyond safe handling levels before they arrived at the plant, SAAMA managers quickly initiated a decontamination program. Convair mechanics used special handling techniques and took precautions, which not only disrupted the smooth operation of the work being done, but also increased the flow time for the affected aircraft. Workers removed the contaminated R4360 engines and shipped them to Kelly, where workers placed them in isolated storage until they could be decontaminated.

In March 1956, Headquarters SAC published a regulation requiring its bomb wings to monitor radiation levels of all B-36s before flying them to Fort Worth for the SAM-SAC modifications. Despite these precautions, some contaminated aircraft still arrived at the Fort Worth plant. Kelly's decontamination project lasted for the remainder of Project SAM-SAC.



Memo From The Boss

MAINTENANCE ENGINEERING DIRECTORATE
SAN ANTONIO AIR MATERIEL AREA
KELLY AIR FORCE BASE, TEXAS

16 April 1952

Hello Folks -

Many years ago when I was a stinking little jerk, I heard one of the old professors say, "You can do anything you think you can." These words I heard; they meant nothing to me at the time. I have since learned that the words are completely true. Our B-36 production is an example.

The B-36 is a very large piece of machinery and all of its gadgets are very complicated. Yet the Aircraft Repair Division has pitched into the problem and B-36's are rolling out at the rate of one every other day. They are on schedule, the workmanship is much improved, and less man-hours have been spent on them than before. Here is a living fulfillment of our triple-threat ambition to get our work out when promised, to do better work, and to save on the cost. All three of these purposes are important.

The Aircraft Repair Division under the firm, just leadership of Ed Nevels has made good on all three of these counts, when the opposite might have been expected. All other divisions have done their parts too. But the fellows in Aircraft Repair believed they could do this job better than it had ever been done before. Because they believed they could, they did. I admire their courage and the results they get.

James L. Jackson
Colonel, USAF. Director

NO.4265 B-36
POWER PACK
PRODUCED 27 AUG. 57

B-36 power packs allowing for Quick Engine Change capability saved both time and money.

Quick Engine Change Program

One of the more important things SAAMA learned from its experience in managing the B-36 and its engine was the idea of the Quick Engine Change (QEC), the build up of engines with accessories into a powerpack that could be installed on an aircraft in the field in a minimum amount of time. The QEC concept cut the costly and time-consuming practice of preparing and then storing an overhauled engine. While Kelly Aircraft Division workers had been doing this on a limited scale for base support aircraft since 1951, SAC expressed an interest in the program for its B-36s. In March 1953, SAC and AMC established a tentative production schedule of twenty-five powerpacks in April.

Mechanics began working in building 310 until the new facility, building 4001 on East Kelly, was ready in April 1954. Once set up in the building on East Kelly, workers cut the time necessary to produce a B-36 powerpack from 2,035 manhours in October 1953 to 831 manhours in May 1954. On July 14, 1954, Equipment Division employees overhauled their 1000th B-36 powerpack.

As the phase-out program for the B-36s progressed, Kelly began phasing down the B-36 QEC program, too. Mechanics completed work on the last B-36 QEC on August 27, 1957. Between April 1953 and August 1957, workers overhauled a grand total of 4,265 B-36 powerpacks in SAAMA shops. But the program did not die; as work on the B-36 QEC wound down, workers increased overhauling powerpacks for other aircraft, including the B-47 and F-102.

Phase out of the B-36

In 1953, the Air Force decided to phase out the B-36 as quickly as its replacement, the jet-powered B-52, could be phased in. On August 14, 1954, Convair delivered its last B-36, "the most important bomber that never went to war." With it came the last R4360 engine. Although production of the last piston-driven bomber ended, SAAMA's involvement continued for the next five years, and Kelly's responsibility continued for another ten.

The B-36 phase out was a learning experience for everyone; it was the first time the Air Force had ever phased out a first-line weapon system. Handling the program required finesse as the B-36 continued to be the nation's front line strategic bomber. It would remain as the cornerstone of American national security policy until the B-52 or B-58 could be produced in sufficient quantities to assume the nuclear deterrence role. As lead air materiel area, SAAMA had to ensure those B-36s remaining in SAC's fleet stayed operationally ready, while managing the phase out program at the same time.

Air Force officials initially scheduled the B-36 phase out over a five-year period, beginning in 1956. The AMC plan designated its facility at Davis-Monthan AFB as the storage, reclamation, and salvage site. The 3040th Aircraft Storage Squadron received and stored the B-36s until a contractor demilitarized and then salvaged them.

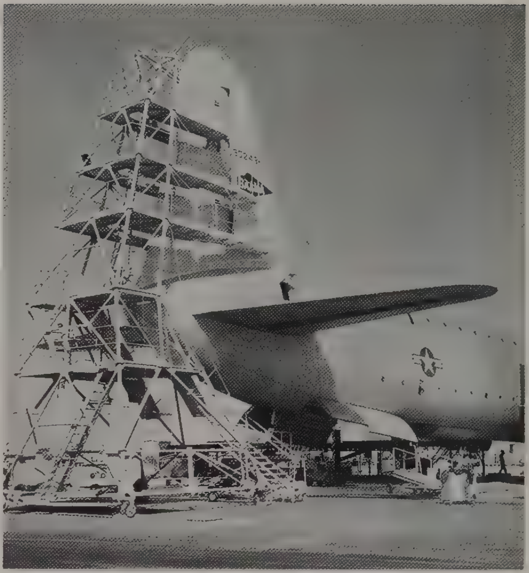
The first B-36 to be phased out arrived at Davis-Monthan AFB on February 7, 1956; by the end of June, twenty-nine of the huge bombers had arrived. Timing became a critical factor, since the storage area only held eighty or so B-36s at one time. With an increasing number arriving each month, it was imperative that a contractor begin the reclamation and salvage effort. Air Materiel Command awarded the contract on June 30 to the Mar-Pak Corporation of Painesville, Ohio, which began reclamation work on the first B-36 on September 13, 1956.

The B-36 phase out went much faster than originally anticipated. On February 18, 1959, Mar-Pak employees began work on the final B-36, the last piston-engined heavy bomber to serve in the Air Force. A total of 339 "Peacekeepers" were demilitarized and their hulls salvaged in just three years, ending another era of SAAMA and Air Force history. As the jet-powered B-52 and B-58 replaced the B-36, Kelly and its workers entered the jet age.

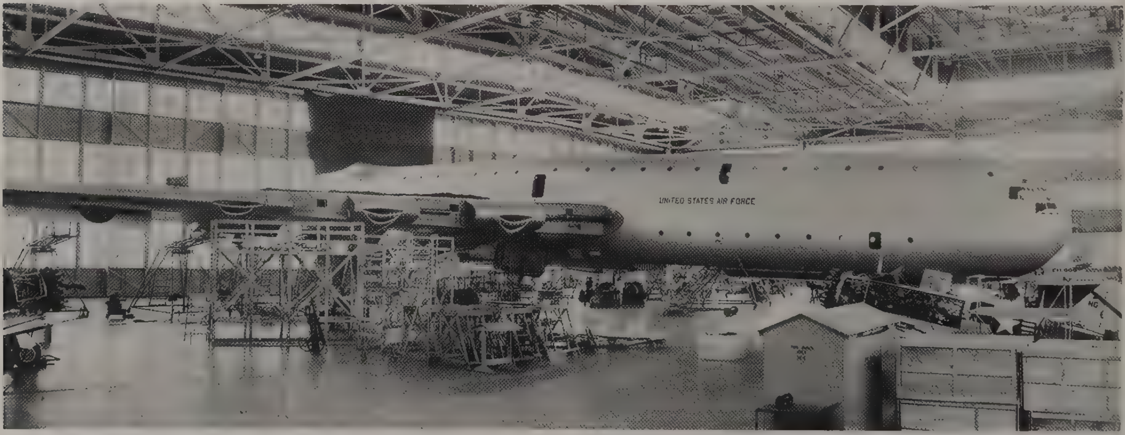
Saga of the XC-99

Just as Air Force officials realized they needed a long range bomber at the start of World War II, they also saw the advantages of a long range cargo transport. While development of the bomber received top priority during the war, events after the war, like the Berlin Airlift, brought home the need for larger transports. In 1947, Consolidated-Vultee workers converted one of their B-36s into the XC-99 cargo transport, the world's largest prop-driven carrier. Only one XC-99 was ever built.

Able to carry 400 troops, 305 stretchers, or 101,000 pounds of freight, the XC-99 attracted attention wherever it flew. Six Pratt and Whitney R4360 Wasp engines powered the XC-99 at a top speed of 300 miles per hour. Wing span of the giant ship was 230 feet, the same as that of the B-36; but the fuselage was 182.5 feet long, nineteen and a half feet longer than its sister ship. Topping off at fifty-seven and a half feet, the vertical fin was as tall as a five-story building. The fuselage of the XC-99 provided 16,000 cubic feet of usable cargo space, the equivalent of three standard freight cars. Fuel capacity of the plane was 21,116 gallons, and the XC-99 could fly more than 8,000



Maintenance on the XC-99's vertical stabilizer was accomplished on a workstand as tall as a five-story building.



Special workstands had to be constructed for maintenance of the XC-99's six engines. Notice that the tail of the plane is so high that it had to remain outside the hangar.

miles without refueling. Each of its six engines required 190 gallons of lubricating oil.

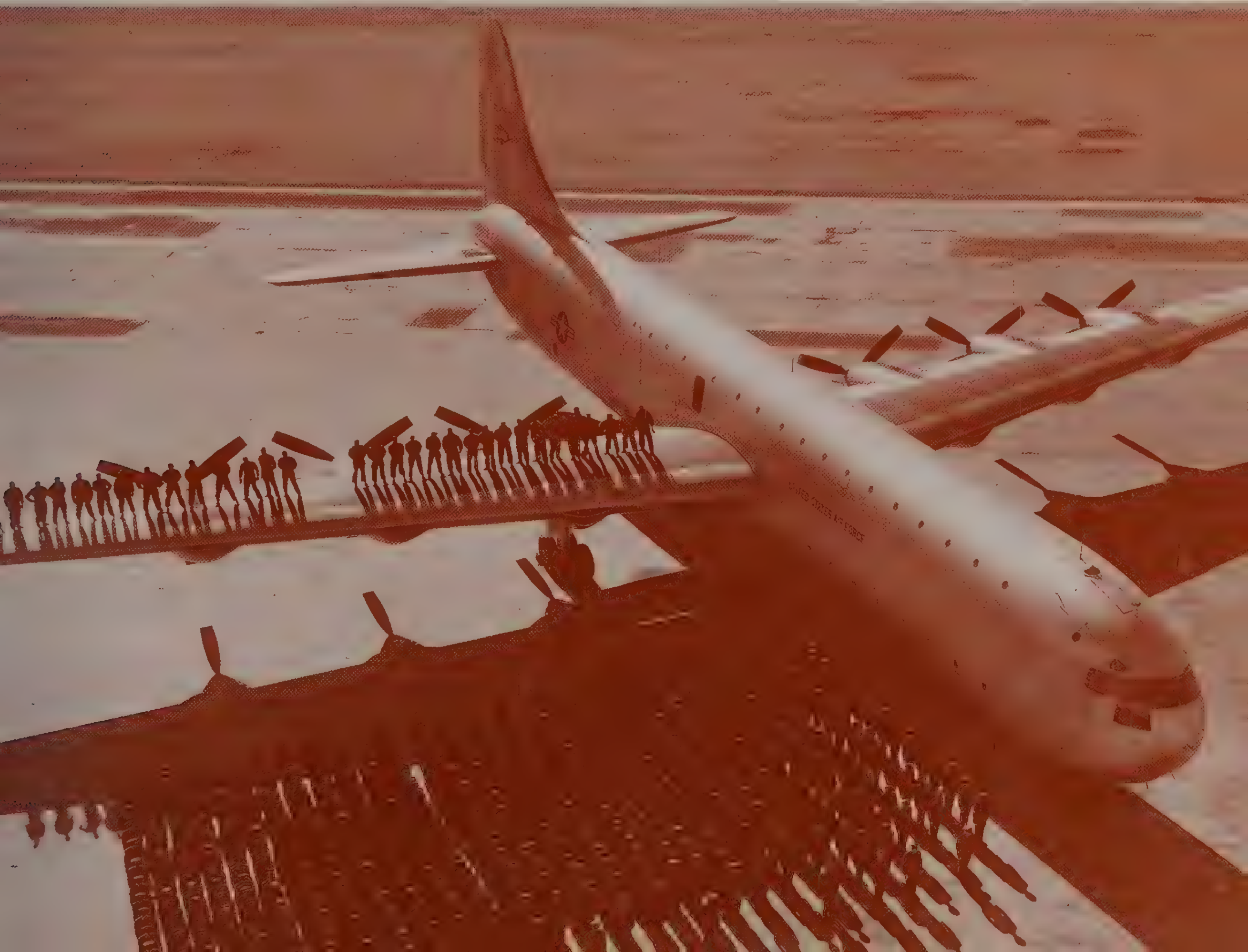
Many parts of the giant cargo plane were interchangeable with the B-36, and workers used B-36 technical orders to keep the XC-99 operational. However, its control surfaces were not interchangeable with the B-36, requiring special manufacture when replacements were needed. This made repair of the plane costly and occasionally prevented it from keeping to a tight cargo delivery schedule.

Pilots and crews of the XC-99 were extravagant in their praise of the plane's performance. While they considered the first fifty feet in take off as critical, pilots reported the plane handled easily once airborne. The XC-99 could land on any paved, 5,000-foot long runway that had a minimum weight capacity of 14,000 pounds. By reversing its props, the XC-99 could back nicely into flight line loading zones before taking off with 60 to 100 percent more cargo than contemporary military transport aircraft.

The XC-99 was so closely associated with Kelly that few remember Consolidated originally built the plane for SAC. Between May 26, 1949, when the Air Force accepted it, and September 8, 1950, when it was reassigned to Kelly, the XC-99's home was with the 7th Bombardment Wing at Carswell AFB, Texas. The XC-99 first landed at Kelly on June 13, 1949, and went into the Maintenance shops the next day for work on the propellers. It returned to Kelly on June 27 after a trip to California for modification and installation of more powerful versions of the R4360 engine. Thus began Kelly's affair with the huge transport.

The XC-99's first cargo flight to Kelly was made on July 14, 1950, with Colonel Frederick Bell, SAAMA's Maintenance Director, as pilot. This

Originally assigned to the Strategic Air Command at Carswell AFB, Texas, the XC-99 ultimately made its home at Kelly.

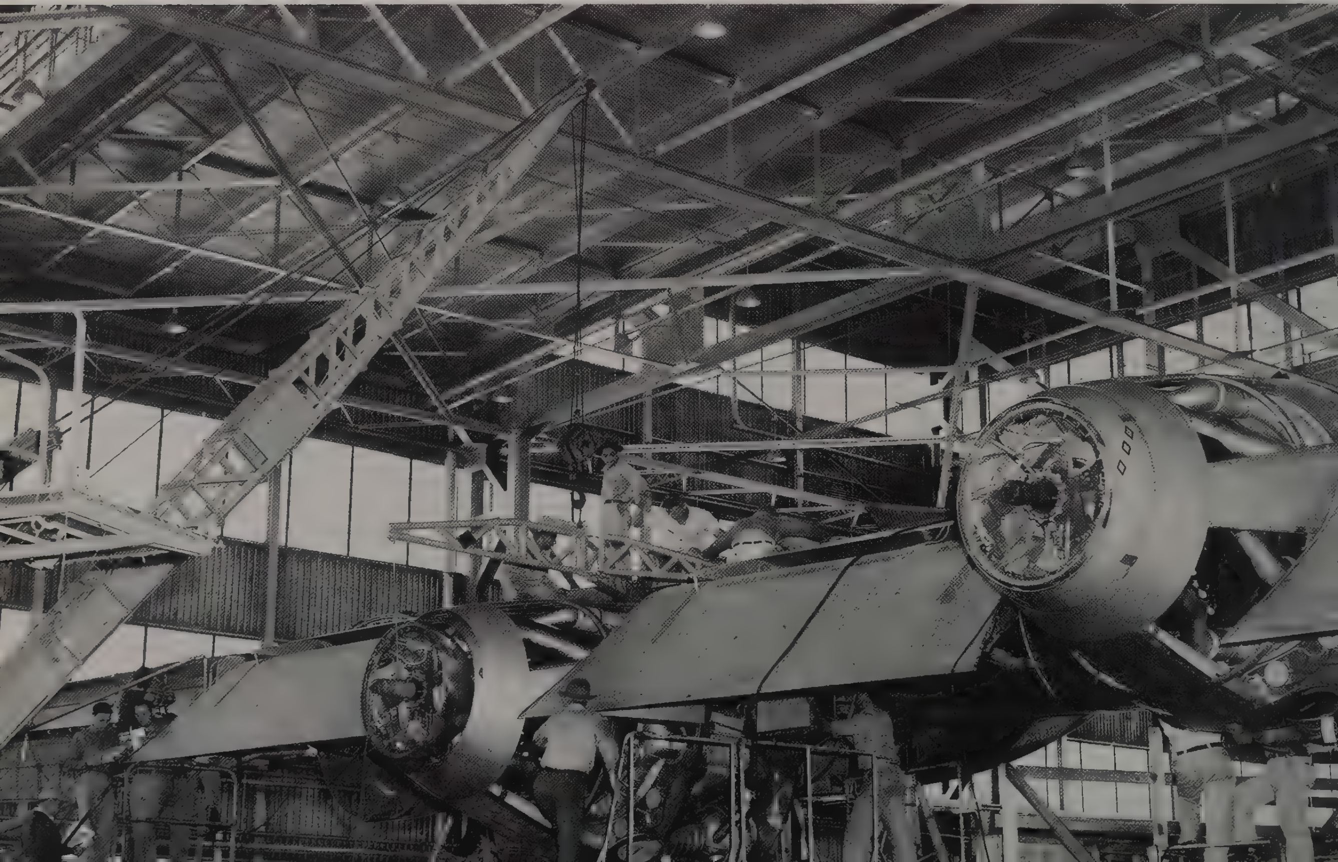


A regular on the XC-99's cargo list was the R4360 engine which weighed nearly 5,000 lbs.

flight, nicknamed "Operation Elephant," established the XC-99's fame. With ten R4360 engines and sixteen B-36 propellers in its cargo compartment, the unique airlifter took off with a payload of more than 100,000 pounds, the first time that had ever been done.

In September 1950, the Air Force transferred the XC-99 from SAC to SAAMA for a fifteen-month practical evaluation of large size transport aircraft. The goals of the operational test program included determining the plane's ability to move heavy loads for long distances, the relative direct and indirect maintenance costs, and the principal features desired in large aircraft. Air Force officials would use the XC-99's performance as a guide in their decision to move toward "super-freighters" or stay with producing smaller transporters. As the evaluation program started, the Korean conflict was placing enormous demands to get supplies to the West Coast for shipment to the Far East. On October 10, 1950, the XC-99 flew forty-two urgently needed C-54 replacement engines (twenty-seven on the lower deck and fifteen on the upper deck) from Kelly to McChord AFB, Washington, to meet the emergency. After landing,

R4360-41 engines being installed on the XC-99 aircraft, inside building 363.



The XC-99 set record after record during its life as the world's largest transport plane.

the pilot taxied the giant XC-99 down a perimeter landing strip with only one-foot clearance on each side.

After extensive modifications to make cargo loading easier, the XC-99 returned to the evaluation program and flew continuously from July 1951 to May 1952. In that ten months, the aircraft flew 600 hours and hauled seven million pounds of equipment and supplies, nearly half of which supported the Korean War.

While operational at Kelly, the XC-99 normally flew supplies to McClellan AFB, California twice a week, returning by other bases or depots depending on destination and cargo priority.

During the plane's first year at Kelly, its crew consisted of Air Force pilots and co-pilots with a special crew of civilian flight technicians. After the modifications in 1951, only military crews flew the giant aircraft. In addition to the pilot, co-pilot, radio operator, and navigator, the XC-99 crew included two scanners, two loadmasters, and two engineers. Scanners watched the flaps, landing gear, and engines, since the pilots could not see these components from the cockpit. Loadmasters directed distribution of the cargo's weight. Described as the most important men on the plane, the engineers monitored the instruments to keep the six twenty-eight-cylinder engines "purring" in harmony.

Interspersed in its regular schedule were special missions that attracted worldwide interest and attention. One of these, and perhaps the most spectacular, was the longest flight the XC-99 flew--12,000 miles to Rhein-Main Air Base, Germany. On August 13, 1953, the plane took off loaded with 61,000 pounds of vital cargo, flying via Bermuda and the Azores. It returned, following the same route, with another 62,000 pounds. At every place it landed, the XC-99 and its crew were received with interest and acclaimed by the news media. At Rhein-Main, roads were blocked on all sides of the airfield as thousands of Germans, carrying blankets and picnic lunches, came to stare.

Because of its unique capacity, the Air Force called on the XC-99 for special jobs. Supporting Project DEW LINE in May 1955, the XC-99 airlifted 380 thousand pounds of cargo 2,500 miles from Dover AFB, Delaware, to Keflavik, Iceland. Alter-

U S AIR FORCE

The XC-99 was the cargo-carrying giant of its day.

nating pilots and crew flew six round trips, for a total of 201 hours and 41 minutes flying time. In addition, its uniqueness often made it the highlight of various air shows around the country. It served as the centerpiece at Kelly's Armed Forces Day open house as well as appearing at air shows at Tinker AFB, Oklahoma; Bolling AFB, Washington, D. C.; and Wright-Patterson AFB, Ohio. At one point, while the plane was at Dayton, Ohio, a lady looking at the plane asked the pilot, "How do you get this thing off the ground?" "We fly it, lady," replied the pilot. Quickly came the retort, "Young man, what kind of a fool do you take me for?"

On November 1, 1954, the status of the XC-99 changed; the Air Force no longer treated it as a "project" aircraft, with special funding for maintenance. Thereafter, base mechanics scheduled and maintained the XC-99 like other Kelly assigned planes, competing with other aircraft scheduled into San Antonio Air Materiel Area shops for overhaul.

From November 1954 to the end of February 1955, the XC-99 underwent its first depot level overhaul. While repair was extensive, modification was limited for the most part to the interior, bringing the plane up to the latest standards. It was scheduled for Inspect and Repair As Necessary (IRAN) again in November 1956, but austere funding and SAAMA's programmed overhaul work load made it necessary to defer the work.

Nevertheless, the XC-99 continued flying, albeit on a reduced scale, until March 19, 1957. At that point, the consequences of failing to provide regular depot maintenance hit home. All future flights had to be cancelled because of the condition of the aircraft. Maintenance personnel estimated it would take 144,734 direct manhours and over a million dollars to return the giant airlifter to first class condition. This was too much money and too much time, considering the on-going phase out of the B-36, and it doomed the XC-99. On July 11, 1957, Headquarters AMC declared the XC-99 surplus to the needs of the Air Force. Air Force Museum officials at Wright-Patterson AFB seriously considered flying the unique craft to the museum to save it, but the cost for even this one-time flight was too high.

Six days later, on July 17, headquarters officials directed SAAMA to transfer the plane to the disposal officer for sale. This was distressing news to many people at Kelly and San Antonio who had a special place in their hearts for the XC-99. To save the unique aircraft from salvage, SAAMA donated the aircraft to the local chapter of the Disabled American Veterans on November 6, 1957. Later it was towed to a site off Kelly, near the main runway, where it still sits, decaying through age and exposure, watching the C-5s fill the role it pioneered.

The Korean War provided an outstanding operational setting to test the XC-99 when it routinely hauled large quantities of materiel around the country, proving that a large plane could carry large amounts of cargo economically over long distances. But once the conflict ended, there was not enough cargo to make continued operations cost effective. During its eight years of operation, the XC-99 flew a total of 7,434 and one-half hours over a distance of approximately 1.5 million miles, the equivalent of flying around the world fifty-nine times. It carried sixty million pounds of cargo.

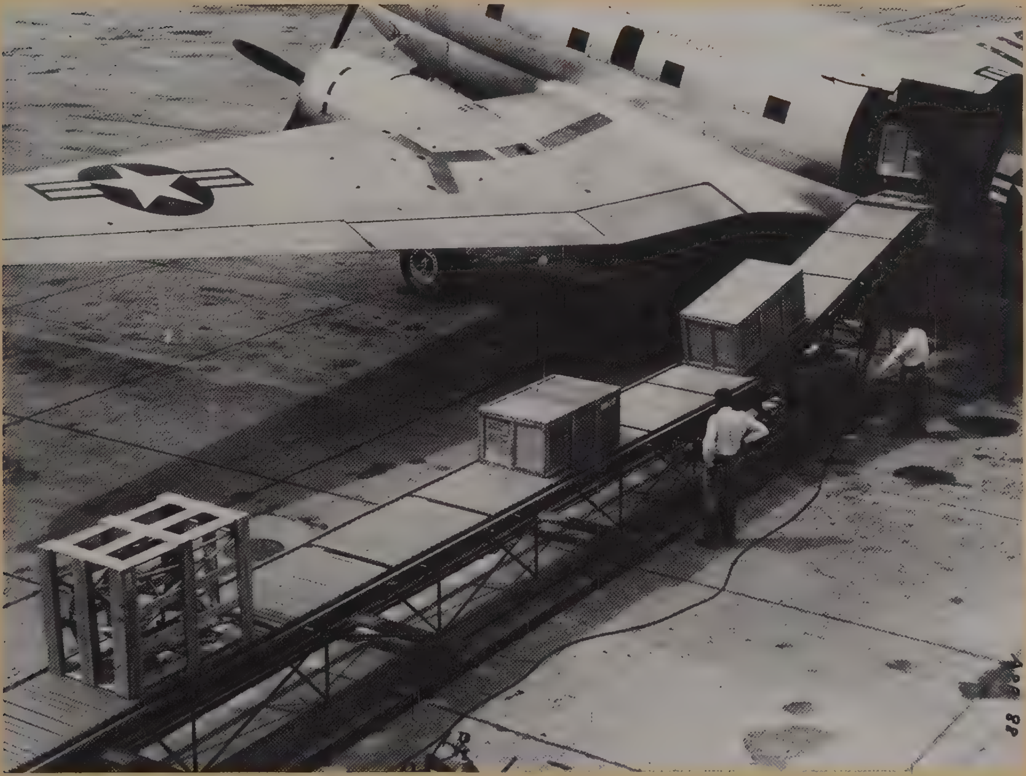
In flying this many hours and airlifting this amount of cargo, Air Force personnel learned many valuable lessons about large cargo aircraft, cargo loading and unloading techniques were improved, and the desirability of larger cargo hatches was proved. Technologically, the XC-99 demonstrated that there was no practical limit to the size an airplane could be built. But by 1957, Air Force leaders looked to missiles to provide "more bang for the buck" and believed that aircraft of this magnitude would not be needed. The future would prove them wrong.

Mechanization

In the late 1940s, as Kelly's personnel authorizations dropped, San Antonio Air Materiel Area officials began planning to mechanize to meet the demands of increased work loads with decreased personnel. By 1950, these plans had become reality; in the fall workers installed huge, overhead conveyor systems to move material in the warehouses in building 4212 on East Kelly and building 171 on Central Kelly. By eliminating much of the manual work and cutting out extensive "lost motion," mechanization cut warehouse processing time in half. Supply officials even extended the benefits of mechanization to speed up records keeping, statistical data gathering, and other necessary paperwork. Conveyors also moved equipment and parts along the maintenance production lines. New automated machines tremendously increased the number of spark plugs overhauled.

In 1951, mechanization efforts succeeded in speeding up aircraft and truck loading and unloading. In April, Supply officials unveiled a new automatic conveyor system that moved cargo between parked aircraft and the loading docks at the air freight terminal. General Clements McMullen suggested the idea, which a Kelly engineer designed and Maintenance workers built. During the trial run, the conveyor system unloaded 4,774 pounds of freight in just eight minutes, an operation that normally took an hour or longer with trucks and dollies.

Supply took another step toward mechanization in 1952 with the opening of the world's longest overhead conveyor system that linked six North Kelly warehouses. Use of the system, a Kelly project from design to construction, to move material between receiving and screening lines and warehouses to a newly established central packaging and shipping area, cut processing time by fifty percent. Work at Kelly would never be the same again!



Kelly engineers designed and built the automatic conveyor system to carry cargo between the parked plane and the air freight terminal.

Global Reach: New Organizations and Responsibilities

Decentralization

As Air Materiel Command entered the 1950s, it sought ways to enhance the effectiveness of its logistics system. One of these was the initiative to decentralize the operational work load at the headquarters, which had become "top heavy" with too many responsibilities. Begun in April 1952, AMC leaders hoped to improved responsiveness and allow the headquarters to focus on its policy and planning functions rather than spending time on day-to-day operational matters. And, as superpower antagonism increased, AMC officials wanted to reduce the vulnerability of Air Force logistics by making the AMAs and depots self-sufficient, able to act without waiting for orders from the headquarters.

Under the decentralization program, the prime depots assumed responsibility for certain aspects of procurement, worldwide depot support, and stock control for components as well as for complete aircraft and engines. San Antonio AMA received worldwide responsibility for property classes dealing with Convair aircraft (including the B-36 and XC-99), Pratt and Whitney engines, and certain airborne communications equipment. New depot responsibilities included initiating purchase documents, executing contracts, computing requirements, preparing budget estimates, and having complete control of distribution and redistribution of items in its assigned property classes. This decentralization program, the biggest innovation in AMC operations since the beginning of the Two-Zone System in 1948, marked the AMAs' entry into the field of logistics management.

To perform the new functions, San Antonio Air Materiel Area's directorates had to form new offices. One of the first was the establishment the Procurement Office, which formerly had been a section in the Directorate of Supply and Services. In October 1951, it became a separate staff office under the Air Materiel Area commander. On July 1, 1952, the office dropped its administrative link with Supply and became SAAMA's third directorate, the Directorate of Procurement. Six months later, on December 18, a Small Business Specialist was appointed at Kelly for the first time to encourage buying goods and services from small firms.

Another organizational change which took place on July 1, 1952, was the establishment of the Deputy for Requirements and Distribution in the Supply Directorate to compute materiel requirements, initiate purchase requests, and determine funding for SAAMA's prime classes. For the first time, AMA personnel became involved with long range planning as they attempted to determine worldwide requirements and funding two years in advance. In addition to working future Air Force requirements, the decentralization program gave the AMAs another totally new responsibility -- planning for the logistical needs of foreign air forces in the Mutual Defense Assistance Pact.

Directorate of Maintenance and Engineering officials established two organizations to handle the new responsibilities gained with decentralization. On October 15, 1952, the new Technical Service Division officially began operating. A small cadre of personnel came down from AMC headquarters in July to teach Kelly employees their new jobs -- writing technical orders and service bulletins, determining final corrective actions for unsatisfactory reports, processing aircraft accident reports, and evaluating engineering change proposals for equipment in SAAMA's prime property classes. A month later, on November 18, the Command Work Load Control Office began operations. It was responsible for scheduling depot level repair for SAAMA's prime class items. Since the B-36 Field Service Office already performed some of these functions, it became the nucleus around which the Command Work Load Control Office was organized.

Headquarters AMC also decentralized contract administration. On October 1, 1953, the AMAs assumed responsibility for administering contracts, reviewing quality, and monitoring production, a job that had been done previously by six air procurement districts. By eliminating the procurement districts, the command hoped to cut out duplication of effort and free needed manpower authorizations for higher priority work loads. San Antonio AMA became responsible for the work load previously handled by the Southern Air Procurement District at Fort Worth and took control of six Air Force plant representatives located at the Aircraft Engine Division for Ford Motors, Nash Kalvinator Corporation, Phillips Petroleum, Beech Aircraft Corporation, and Consolidated-Vultee at plants in Texas and California. This arrangement lasted until the 1960s when Air Force Systems Command assumed these responsibilities.

Lieutenant Colonel Guy Hix (on left), Kelly's Home Owning Consultant, worked with Kellyites to find suitable housing. With Colonel Hix is Adelene Hodges, Helen Collins and George Cardenas.

Kelly's Home Owning Consulting Service

General McMullen's popularity with Kelly workers came from the knowledge that they were important to him. One of their more serious problems after the war was the scarcity of adequate housing. While the opening of Billy Mitchell Village alleviated housing shortage for Kelly's military personnel, many of the base's civilians still had difficulties not only in finding a house, but also understanding the intricacies of mortgages, points, and financing. To help Kelly's people find housing, General McMullen established the "Buy-a-Home" program in March 1951 and appointed his assistant, Lieutenant Colonel Guy F. Hix, as the base's home owning consultant.

Colonel Hix had a genuine interest in his job, and his work paid off. Between March 1951 and November 1952, he helped Kelly employees buy homes worth $3.5 million, saving them thousands of dollars. His "customers" were a varied group, ranging from a worker whose home was destroyed by fire, to a family who grew too large for their home, to the first employee who came to Kelly from Wright-Patterson Air Force Base with the AMC Decentralization Program.

In April 1952, the San Antonio Home Builders Association recognized Kelly's unique home owning consultant service. The real success story, however, was the hundreds of Kelly families who were helped. Kelly cares.

Inspect and Repair as Necessary Program

As the Cold War and the soaring prices of new technology pushed the defense budget upwards, presidential and congressional pressure forced the military to control the costs of normal operations. One response to this pressure was the Inspect and Repair as Necessary (IRAN) program. Kelly mechanics first began using the IRAN concept on July 1, 1953. The purpose behind the IRAN concept was to produce an aircraft, engine, or component that would operate safely and efficiently until its next reconditioning cycle without spending extra time, money, or effort.

Previously, workers took apart an item undergoing depot-level repair, inspected it, reconditioned it by changing out anything that was questionable, and returned it to the using command in "brand new" condition. This practice often meant changing out items that did not affect operational capability or replacing an entire component rather than just the damaged part. As a result, depot personnel were overloaded with nonessential work, which added to the costs and kept the aircraft out of service longer. By only replacing or repairing those parts that needed it, the cost of depot maintenance was halved and aircraft spent less time waiting on maintenance. Both AMA and using command personnel had a difficult time adjusting to this new depot maintenance philosophy, but by 1956, it had become standard procedure.

New Organizations

2837th Specialized Depot Group

As the atomic bomb became the cornerstone of American security policy after the war, the military services established various organizations to work with nuclear weapons. Strategic Air Command crews and aircraft would deliver the nuclear blow, but the Air Force needed an organization dedicated to the management and repair of nuclear weapons, components, and kits. In July 1950, a small cadre of fourteen men transferred from Kelly to Kirtland AFB, New Mexico, to set up an organization for this nuclear support mission. Five months later, on November 20, AMC officially activated the 2837th Specialized Depot Group at Kirtland and assigned it to SAAMA.

However, the new group had problems finding enough personnel to carry out its assigned mission of providing concentrated storage, distribution, and maintenance of special weapons, kits, weapon and kit components, and training equipment. On top of this, there was a housing shortage at Kirtland, creating problems for the group's personnel. Hoping to solve these problems, AMC officials decided to move the group back to Kelly. By the beginning of 1952, planning to move the 2837th was well underway. In January, work started on the group's new home, building 1556, which would provide office space, storage, and shop facilities. Kelly's Civilian Personnel Office concurrently began recruiting workers to fill the group's vacancies. On February 14, 1952, Headquarters AMC published Movement Orders Number 1, authorizing and directing the SAAMA commander to move the 2837th Specialized Depot Group from Kirtland to Kelly, with all of its organizational equipment and stocks on hand, including active Class 09-D items (nuclear ordnance commodity managed items) and other items not available at the south Texas base.

Twenty-eight people made the move from Albuquerque to San Antonio, including eight of the original fourteen group members, in three stages: on February 8, 14, and 22. The depot became operational on February 20, 1952, and passed inspections in March, which certified the group as capable of performing its Atomic Energy Commission mission. By June almost all of the supply positions were filled, but because of the Top Secret clearance requirement and unusual type of repair work involved, it took longer to hire qualified maintenance workers.

The AMC Decentralization Program affected the 2837th Specialized Depot Group, too. New responsibilities gained included cataloging, requirements and distribution, and budget computation for nuclear equipment. The group would also be responsible for distributing special weapons publications to the appropriate Air Force units. At the same time, the military was revising management of nuclear resources, taking over control from the Atomic Energy Commission, which had handled nuclear management since the war. The Secretary of the Air Force gave logistical responsibility to AMC, which, in turn, delegated it to SAAMA and the 2837th. On January 1, 1953, AMC named the 2837th Specialized Depot Group as SAAMA's fourth directorate -- the Directorate of Special Weapons -- and inactivated the depot group the following August.

UNITED STATES AIR FORCE

Lieutenant Colonel Theodore Witt, 19th Logistics Support Squadron Commander, congratulated the first crew to complete 1000 hours in the C-124 aircraft.

19th Logistics Support Squadron

On September 24, 1952, Headquarters Air Materiel Command activated a new organization at Kelly, the 19th Logistics Support Squadron. The first squadron of its kind, the new squadron was formed to provide worldwide airlift in direct support of special weapons. It remained at Kelly throughout its thirteen year history. The first C-124 assigned at Kelly arrived in September 1952 for the new organization. Within just a year, the pilots and crews of the 19th Logistics Support Squadron were hauling more cargo than any other freight-hauling unit on Kelly. In September 1953, the squadron ferried 662 thousand pounds of cargo in just thirty-two hours of flying time.

The 19th's safety record was truly amazing. In over thirteen years, it had only one accident. Flying relief supplies to hurricane and flood victims in the British West Indies in August 1956, one of its C-124 aircraft landed short of the runway, crashed and burned. One crew member died, but the others received only minor injuries.

The 19th Logistics Support Squadron served under several organizations during its thirteen years. Originally activated as a unit under the San Antonio Air Materiel Area, the 19th became a part of the 3079th Aviation Depot Wing, Wright-Patterson AFB, Ohio, on February 6, 1955. On July 1, 1962, the squadron went under jurisdiction of the 39th Logistics Support Group, a new Kelly organization. That lasted only a year, however, for on July 1, 1963, the 19th left AMC for the Military Air Transport Service as a member of the 62nd Air Transport Wing, McChord AFB, Washington. On July 8, 1964, the unit was redesignated the 19th Air Transport Squadron (Special) and then the 19th Military Airlift Squadron (Special) on January 1, 1966. As a part of the Military Airlift Command, successor to Military Air Transport Service, the 19th's job was to provide military airlift of personnel and cargo in either a wartime or peacetime environment in support of MAC's global mission.

As a result, the Kelly-based squadron saw service during the Cuban Missile Crisis in 1963, earning an Air Force Outstanding Unit Award, and hauled cargo to Southeast Asia during the Vietnam War. On November 13, 1969, the last C-124, carrying helicopters to Tan Son Nhut Air Base in South Vietnam, "lunged" from Kelly's concrete runway on the final mission flown by the 19th Military Airlift Squadron. The 19th, a victim of defense cutbacks, was deactivated on December 22, 1969. The deactivation of the unit, and its final C-124 flight, marked an end to another year of Kelly history.

Personnel with Kelly's Directorate of Special Weapons performed a variety of tasks to manage nuclear weapons for the Air Force.

Other Air Force organizations transferred nuclear responsibilities and work loads to SAAMA's unique directorate. On July 1, 1956, the Directorate of Special Weapons became the Nuclear Ordnance Commodity Manager for the Air Force, providing a single point of contact for the logistical support of nuclear material. Its responsibilities included nuclear weapon control, nuclear safety and security, training weapons, ground handling and test equipment, retardation devices, technical data, test programs, and plans.

The Air Base Wing Concept

Command officials had reviewed the relationship between the area headquarters, depot, and the base intermittently since World War II. Prior to 1944, the area air technical service commander, the depot commander, and the base commander (all located on one installation) had separate missions and more than enough to do; but in January 1944, responsibility for the sub-depots shifted from the area air technical service commands to the major commands the sub-depots supported. This left only the air depot and the base under jurisdiction of the area commander who, naturally, became increasingly interested in these operations. In November 1944, these three operations were integrated, and the commander of the San Antonio Air Technical Service Command became commander of Kelly Field.

While this caused some administrative problems, it worked fairly well until 1952. As the air materiel areas assumed more and more management responsibility from Headquarters AMC, the job of AMA commander became increasingly complex. At this point, AMC officials argued that the area commander was so preoccupied with the details of running the base he had little time to devote to the larger and more pressing problems of AMA operations. They believed having a separate base commander would free the area commander from the responsibilities of base operations. In May 1953, AMC successfully tested the base commander organization concept at San Bernardino and Ogden AMAs and extended its implementation at the remaining AMAs. On August 1, 1953, AMC designated and organized air base wings at each of the AMAs. Kelly's was the 2851st Air Base Wing, commanded by Colonel Laurence A. Growden.

Basically, the plan delegated the functions of the base executive to the air base wing. It also dual-hatted some responsibilities in both organizations to avoid duplication: although assigned to the 2851st Air Base Wing, the air installation, services, and personnel officer, along with the commanders for depot training and medical services, served on the AMA staff; while the comptroller, adjutant, inspector general and staff judge advocate, who worked for the SAAMA commander, were also a part of the air base wing staff.

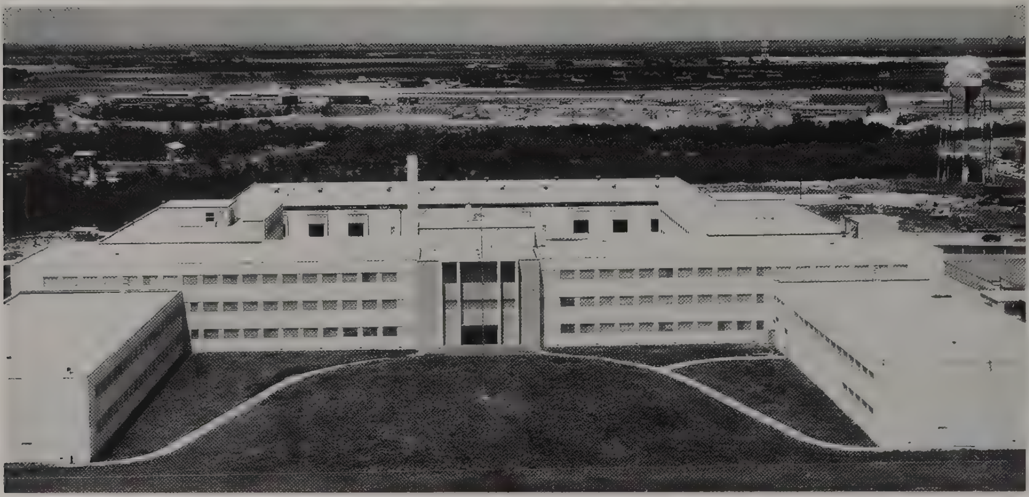
While Kelly fell in step and had a separate base commander, the San Antonio Air Materiel Area commander, Major General Thetus C. Odom, was reluctant to relinquish his role as Kelly commander. In a December 1954 letter to the AMC commander, General Odom wrote, "The Wing-Base concept assumes the AMA commander, while being the depot commander, does not command the base on which the depot is located. I believe the depot and the base are one and the same."

Furthermore, the SAAMA history for January to June 1955 states, "Recognizing the fact the base commander (or wing-base commander) had never actually functioned as such at Kelly since the implementation of the 'base commander' organizational concept of 1 August 1953 . . . ."

General Odom recommended giving the air base wing commander the additional duty of Director of Support Activities. As such, he would serve on the AMA staff and deal with the day-to-day operation of the base, but keep title of commander to handle court martials and other military justice responsibilities. This way, the SAAMA commander would be relieved of running the base but retain the title of Kelly Air Force Base commander.

Obtaining approval to modify the standard AMC organization to meet General Odom's views proved laborious. Finally, on March 10, 1955, Headquarters AMC authorized a six-month test of the Directorate of Support Activities, but several more months passed before SAAMA received approval to implement the other changes it wanted. Finally, on July 1,

Colonel Laurence A. Growden, the first 2851st Air Base Wing Commander (extreme left), presides over a brief ceremony commemorating the 42nd anniversary of Lieutenant George E.M. Kelly's death.



The United States Air Force Security Service (renamed the Electronic Security Command in 1979) moved its headquarters from Brooks AFB to Kelly in 1953.

San Antonio Air Materiel Area implemented its Director of Support Activities organization and used the Support Activities Directorate for the next five years until AMC once again pushed for organizational standardization among the air materiel areas.

Security Service Moves to Kelly

Kelly became home to another organization during the summer of 1953 when the United States Air Force Security Service moved into its new headquarters on "the Hill" at Kelly. Headquarters Air Force organized Security Service as a major command in October 1948 to manage Department of Defense cryptologic operations, provide communications security services for the Air Force, and maintain a data and analytical center for electronic warfare planning and operations. In May 1949, Headquarters Security Service moved to Brooks AFB, Texas, where it occupied the old wartime station hospital array of pavilions and adjoining barracks.

In 1951, the Air Force decided to move Security Service (renamed Electronic Security Command in 1979) to the area called "West Kelly," adjacent to Lackland AFB. A complex consisting of a $4 million, three-story headquarters building; barracks for enlisted personnel; and an 80,000 square-foot warehouse for its sophisticated electronic and cryptographic equipment was built for the command. Completed in the spring of 1953, it took Security Service personnel a month, between July 15 and August 15, to move into the new facilities. The command headquarters is now the largest associate unit on Kelly AFB.

New Responsibilities

The B-36, with its R4360 engines, was the last of the great reciprocating engine aircraft that came out of World War II. By the late 1940s, it was clear that jet propulsion was the wave of the future. During the last six months of 1952, Kelly received its new aircraft assignments. As manager for the Convair aircraft in the Air Force's inventory, its new responsibilities included aircraft components for the YB-60 bomber (a modified, all-jet version of the B-36 of which only two were built); the C-131 "Samaritan;" and, perhaps most significantly, the F-102 "Delta Dagger."

Two years later, in the last half of 1954, Air Materiel Command assigned San Antonio Air Materiel Area specialized repair responsibility of the Air Force's newest strategic bomber, the B-52 "Stratofortress." Oklahoma City Air Materiel Area was designated "prime" or "lead" depot for the new heavy bomber.

Kelly entered the jet engine business relatively late. On August 4, 1953, SAAMA received its first jet engine responsibility when Headquarters AMC designated it a minor repair activity for the J48, J33, J35, J47, J57, and J65 jet engines. Of these engines, perhaps the most significant was the J57, powerplant for the early model B-52, F-100, and F-102. On February 26, 1954, SAAMA's engine shops received their first jet engine, a J33A, for repair. While Kelly workers tested and made minor repairs to these Pratt and Whitney engines, most of SAAMA's responsibility lay in management, including all documentation to ensure the engines were produced and delivered on time.

San Antonio Air Materiel Area picked up prime and specialized overhaul responsibility for the Pratt and Whitney T34 turbo-prop engine in the last six months of 1954. This was the first jet engine for which Kelly had prime responsibility. The first T34 engine arrived at Kelly during the last week in January 1955. Engine Division personnel used this semi-production model to set up the training program for the new engine.

From this "humble" beginning, the south Texas depot would progress toward an ever deeper involvement in the maintenance and management of turbo-prop engines, including the T50, T54, and T56. The first T56 engine arrived at Kelly the end of November 1955, and once again, Engine Personnel used it to prototype their repair procedures before going into full production. Thirty-six years later, Kelly personnel were still working with the T56 turbo-prop engine.

The T34 turbo-prop engine was the first jet engine for which Kelly had prime responsibility.

MILITARY AIR TRANSPORT SERVICE
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Kelly assumed new responsibilities in the 1950s, including those for the C-131 "Samaritan."

MILITARY AIR TRANSPORT
SERVICE

Kelly's Continental Connections

At the close of World War II, the Army Air Forces' Air Transport Command (ATC) operated the Military Air Transport Service, a worldwide transportation system to carry cargo and passengers; an aeromedical evacuation system with a fleet of hospital planes; and Ferry Control. Within a year of V-J Day, consolidations and inactivations had cut the number of ATC's operating divisions from nine to three, but Kelly benefited from this downsizing. On April 30, 1946, representatives of the San Antonio Air Technical Services Command and ATC signed an agreement, granting ATC use of Kelly Field. The facilities ATC gained at Kelly included use of a freight and passenger terminal (building 1614) and ramp space, but no hangars. Its personnel had to maintain its fleet outside under the blazing Texas sun. In just two short weeks, May 15, ATC's 5th Air Transport Group inaugurated "The Alamo," the all-military, scheduled passenger service between San Antonio and Washington, D.C. In the first month alone, "The Alamo" carried nearly one million passengers.

Further budgetary and personnel reductions forced ATC to consolidate even more. In October 1946, ATC announced it was expanding the Military Air Transport division at Kelly, making San Antonio the hub of its operations within the continental United States. With ten C-54s flying into and out of Kelly, the 5th Air Transport Group ferried almost 6,000 pounds of cargo and over 1,000 passengers a month. In January 1947, Kelly became a stop for C-54 "Samaritan" hospital planes on their run between Westover AFB, Massachusetts, and Travis AFB, California.

Passage of the National Security Act of 1947 increased the pressure for unifying similar functions within the military. An obvious choice was the consolidation of the air transport systems run by the Air Force and the Navy. On June 1, 1948, the Naval Air Transport Service officially joined with the Air Transport Command to form the Military Air Transport Service (MATS) to operate a global air transport system for the Department of Defense. Consolidated operations preceded the formal organization of the Command, however, for in February, Kelly's air transport group assumed operational control over all scheduled C-54 domestic cargo flights. During the first month of consolidated operations, the group moved 3.2 million pounds of cargo. That amount had increased to 4.4 million pounds by April. In June 1948, Major General Bob Nowland arrived to take command of MATS' newly activated Continental Division, with its headquarters in today's building 3030 on East Kelly.

Activation of new operational groups quickly followed establishment of the Continental Division. By December 1948, Kelly was home to the 1700th Air Transport Group. The Korean War forced a tremendous expansion of military air transport systems; by the end of 1950, the 1700th Air Transport Group had five air transport squadrons, a ferrying squadron, a maintenance squadron and an air traffic squadron operating under it. Within a year, the ferrying squadron had grown to the 1708th Ferrying Group.

Military Air Transport Service units continued to call Kelly home until 1958, when Headquarters Air Force announced a consolidation of MATS operations. Kelly's Headquarters, Continental Division, with its operational units, transferred to Travis AFB in June, where it was redesignated as Headquarters, Western Transport Air Force. After ten years, Kelly AFB lost one of its oldest and best known associate organizations.

The Changing Face of Kelly

More Land and New Facilities

As the new aircraft developed after World War II grew larger and their engines became more powerful, the buildings and runway complex built on the field in the 1930s and 1940s seemed to shrink, dwarfed by the mammoth aircraft resting on the maintenance ramps. During the 1950s, the base experienced its largest construction boom since 1944. The face of Kelly changed forever as construction began on the largest aircraft hangar in the world and the old Kelly Number 2 flight line was torn down to make room for the new two-mile-long runway.

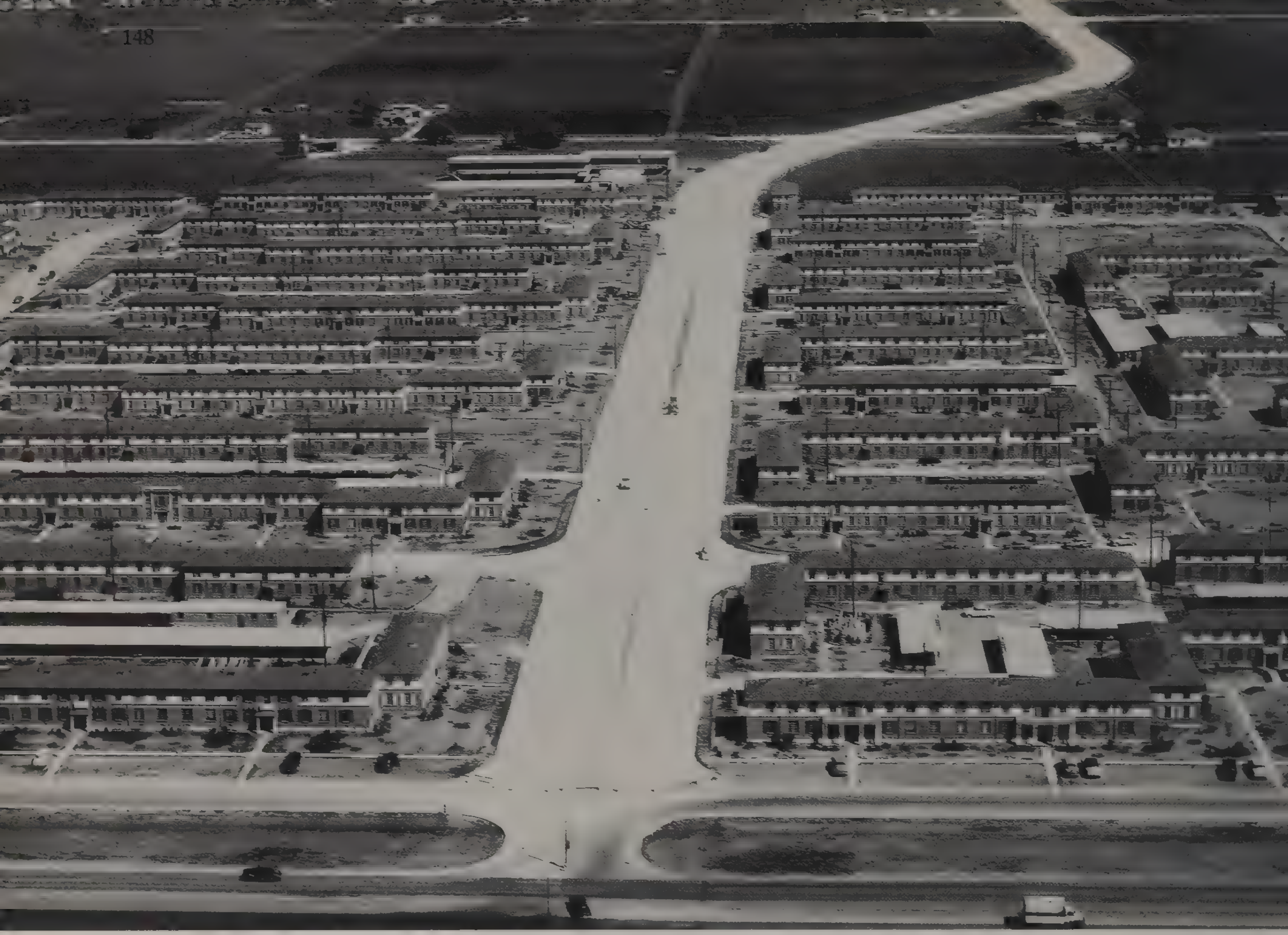
Throughout the 1950s, work also continued on Kelly's engine test cells located at the southwest corner of the base. As new aircraft engines entered the Air Force inventory, SAAMA constantly had to build new test cells or remodel old ones to accommodate more powerful engines. Contractors built large propeller-type test cells for R4360 engines and even larger ones for higher horsepower reciprocating engines and turbo-prop engines. Test cells for jet engines also became necessary as SAAMA got more heavily involved in jet propulsion.

New depot maintenance facilities also appeared during this time. Completed in the latter half of 1952, the new fuel accessories facility was built initially for repair of R4360 carburetors and fuel injection systems. Building 308, the communications or avionics building, was completed in April 1953 and contained an elevated tower for testing radio and radar equipment.

General McMullen Drive

With over twenty thousand workers, getting on and off of Kelly was a nightmare. Only a few roads came into the base, and traffic jams were the norm rather than the exception. After extensive surveys affirmed the need and feasibility for such a thoroughfare, Air Force and city plans to extend Stephenson Road to create an access road to Kelly and Lackland AFBs moved closer to reality in 1951 when San Antonio's City Council authorized purchase of the necessary rights-of-way for the road within the city limits. In 1952, the Bureau of Public Roads decided that the Stephenson Road extension qualified for the Military Access Road Program, which meant congressional appropriations would pay for its construction. Final plans, forwarded to Washington, D. C. in

New engine test cells had to be constructed to accommodate the powerful R4360 engine.



Construction of General McMullen Drive provided Kelly workers a "straight shot into the base."

called for a divided thoroughfare from Kelly to Culebra Road and a regular four-lane road from there to Bandera Road. Finally, on July 27, 1953, the Bureau of Public Roads allocated $1.05 million for the road. Actual construction started in October.

As H. B. Zachry workers began the new road, the City Council announced it was naming the road General McMullen Drive, in honor of San Antonio Air Materiel Area's retiring commander. (General McMullen retired on February 28, 1954.) Work progressed at such a rapid pace that the first portion of the road, from Billy Mitchell Village to Anderson Road, opened on April 8, 1954. Base officials expected even this small portion to help relieve Kelly's traffic congestion at quitting time. The entire 4.4 mile stretch of road between Kelly and Culebra was completed in July and gave those Kellyites living on the north side of town a "straight shot" into the base.

The "Big Hangar"

But of all these facilities, perhaps the most significant was the one included in the fiscal year 1953 military construction program budget--a combination of aircraft maintenance shops and hangar space, which became the largest single structure ever built by the Air Force. Previously, Kelly mechanics either worked on aircraft in building 324 (completed in 1933), or on an outdoor production line, under the searing Texas sun in the summer and in the cold during the winter.

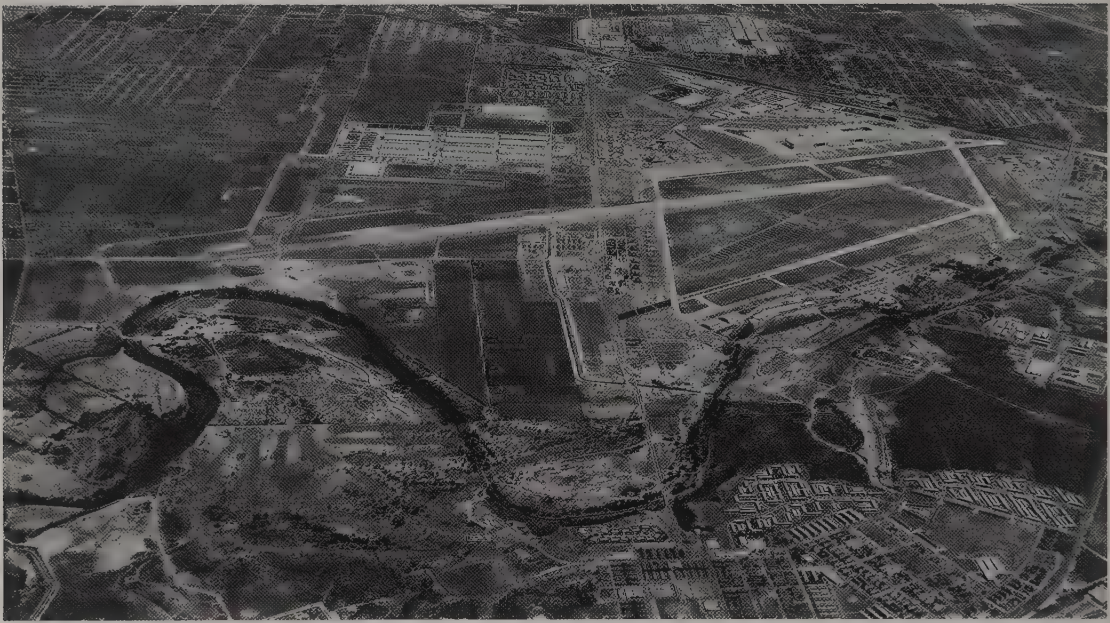
With the advent of the B-36, aircraft became too large to fit into Kelly's existing facilities, so in 1951 San Antonio Air Materiel Area's Maintenance officials began planning for a hangar large enough to house ten B-36 bombers undergoing assembly-line repair simultaneously.

Construction began on November 17, 1953, when 200 thousand cubic yards of earth were excavated. Contractors installed four miles of underground drainage lines before laying down a "Texas-sized" apron or ramp, consisting of forty-four acres of sixteen-inch-deep concrete. By the end of 1954, all 13,000 tons of structural steel was in place, the roof over the shop portion of the building was completed, and most of the roof over the hangar was in place. Support for the 1.25 million-square-foot facility (the equivalent of twelve football fields) came from rigid trusses weighing 300 tons each. The architects used bridging principles in the building's design -- the walls bear the entire weight of the building. There are no internal columns for support on the hangar floor.

With the "Big Hangar," Kelly had its aircraft production line and supporting shops under one roof for the first time. San Antonio AMA officials ceremonially opened the "largest hangar in the world" on February 15, 1956, although the first group of maintenance workers did not move into the huge building until July. Two B-47s were the first aircraft to move off the sun-baked overhaul line into the hangar's "high bay" area.

As early as 1945, Kelly AFB officials had been planning for construction of the "Biggest Hangar in the World."

The "Big Hangar"



Kelly's new runway officially opened on March 16, 1956.

Demise of the Kelly Number 2 Flight Line

The old flight line on Kelly Number 2 saw the Air Force grow from linen-covered Jennies to aluminum-skinned transcontinental bombers. For thirty-eight years, most of the pilots in the Air Service, Air Corps, and Army Air Forces earned their wings at Kelly. The walls of its old World War I era hangars reverberated with the sounds of JN-4s, P-12s, and AT-6s roaring to life, while the buildings that housed the Advanced Flying School echoed with the voices of young men honing their flying skills; young men like Ira Eaker, Charles Lindbergh, Claire Chennault, and Nathan Twining. But the old historic flight line became a victim of progress. Kelly's runway complex built in the 1940s was too small for new jet bombers like the B-52 and B-58. Base officials began planning for a "super" runway in 1954, which would run right through the middle of the old Kelly flight line and its tiny hangars, officer quarters, cadet barracks, offices, classrooms.

Early in 1955, demolition crews began tearing down the old wooden buildings that made up the old Kelly Number 2 flight line to make way for the new runway. A San Antonio construction firm, H. B. Zachry Company, won the contract for the 300-foot-wide, 11,550-foot-long, $4.6 million runway. Preliminary work began in February, but the actual ground breaking ceremonies did not occur until March 23. To accommodate the two-mile-long runway, the Air Force had to buy 461.86 acres of farm land known as the "old Belgian Gardens." Some of the farmers living on the land loudly complained that they had not received fair market value for their acres. For a while, local newspapers published their objections, but as this produced little reaction from most San Antonians, the complaints died a natural death.

Not only did Kelly's historic flight line fall victim to the new runway, but so did Andrews Road that ran along the old flight line, connecting Lackland and Kelly AFBs. Plans called for construction of a new road that would go around the north end of the runway. Adding seven extra miles to the road between Kelly and Lackland caused an uproar among those Lackland personnel living in Kelly's Billy Mitchell Village and Billy Mitchell Village businessmen. They proposed building a tunnel under the runway instead of rerouting traffic around the perimeter. Reality prevailed, however, once Kelly officials explained the enormous cost of such a project and the safety aspects involved. The old Kelly-Lackland road closed on May 30, 1955, and it was permanently severed on October 17. All subsequent traffic had to use the new perimeter road. On September 29, 1956, the San Antonio City Council honored Colonel Laurence A. Growden, the first

Construction of the new Special Weapons building began in May 1954. Integration of Special Weapons functions--materiel management, supply, maintenance and quality control--into a single facility solved a major maximum security problem.

commander of Kelly's 2851st Air Base Wing, by naming the new road after him. Colonel Growden died while on active duty at Kelly on June 26, 1954.

Construction on the runway complex progressed steadily throughout 1955. Work had progressed to such an extent that on December 10, five AT-6 trainers in transit from Missouri to Guatemala prematurely "christened" the new runway. Flown by Guatemalan officers with little or no knowledge of English, the AT-6s accidently landed on the open expanse of concrete, as the pilots ignored or misunderstood light signals from the control tower. The runway received no damage from this accidental use.

The official dedication occurred on March 16, 1956, as an F-102 touched down at Kelly for the first time. While the entire two-mile runway was not finished, there was enough space for the new fighter-interceptor to land. By the end of June, the contractor had completed the primary runway; most of the taxiways and aprons; and all runway, taxiway, threshold, and approach lights were in place. The new runway complex passed its final inspection on August 3 and went into immediate operation, marking an end to the years of grass landing fields and wooden hangars.

Kelly Grows Even Larger

By 1951 Kelly's existing storage lots and warehouses were filled to capacity, while new missions were making increasing demands on its overloaded facilities. Kelly desperately needed new warehouses. In planning for Kelly's fiscal year 1952 military construction program, base officials included construction of a $2 million, 480,000 square-foot depot supply warehouse and a $1.45 million warehouse, shop, and administrative space for the Directorate of Special Weapons. But before these facilities could be built, Kelly needed more land. In

1,564 acres of farm land adjacent to the existing base area. Not only did this price estimate prove completely unrealistic, but the Air Force ran into congressional skepticism over the need to acquire more land. Private citizens, concerned over what they perceived as a massive federal land "grab," prompted their congressmen to demand a thorough review of every construction project involving land acquisition. Kelly finally acquired 258.15 acres of land for $663 thousand in 1953. The land purchased ran west of Billy Mitchell Village and then north and west of the 1500 area warehouses.

In addition to the delay in acquiring the needed land, concern over construction of new warehouses also postponed construction. Headquarters Air Force launched an exhaustive study to determine the most efficient way to warehouse material and equipment, comparing new construction to renting storage space or contracting warehouse operations. Despite serious concern over building warehouses when commercial facilities were available, Kelly got the "green light" for both the new depot warehouse and the Special Weapons facility in 1954. Construction on Special Weapons building started in May 1954 and the depot warehouse the following September. All work was essentially complete on both facilities in the fall of 1955 when a new problem surfaced.

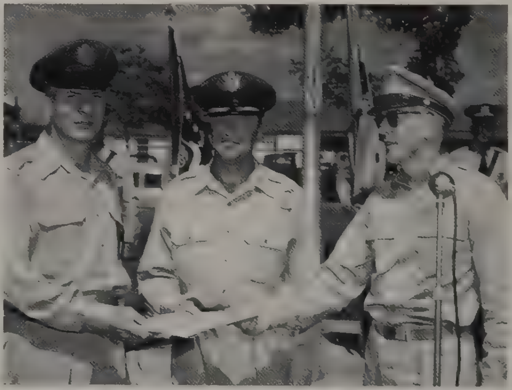
Both of the new buildings followed the specifications in a standard design called the "Standard AMC Depot Warehouse." Unfortunately, AMC learned the design was faulty when part of a facility at Gentile AFB, Ohio, built to that design collapsed. Investigation revealed a problem in the design. The supporting framework for the roof had to be strengthened by installing steel bands around the girders and then covering them with metal lath and plaster for fire proofing. The price for this work on Kelly came to $309 thousand for the warehouse and $152 thousand for the Special Weapons building, but no funds were available. Both directorates were in dire need for the space. In fact, the Directorate of Supply and Services needed the warehouse so badly that its personnel prematurely moved material into 10,000 square feet of the new facility. Finally, Headquarters Air Force allocated the funds. Contractors started work first on the supply warehouse, building 1534, in September 1956 and completed it on April 11, 1957. Work on the Special Weapons facility, building 1420, began a month later in October and was finished on July 27, 1957.

Acquisition of Kelly Annex Number 1

During the 1950s, as nuclear supremacy became the hallmark of American defense policy, the belief that World War III would be fought predominately by the Air Force dominated defense planning. Consequently, the 1950s was a decade of Air Force expansion and Army contraction, which meant the Air Force needed more storage space while the Army had surplus warehouses. Ever cost conscious, the Department of Defense decreed no more new warehouses would be built until all excess Army warehouses transferred to the Air Force.

As a result, negotiations began in August 1954 for SAAMA to assume responsibility for the San Antonio General Depot, a complex of Army warehouses located on Fort Sam Houston, approximately ten miles northeast of Kelly. This was Kelly's largest land acquisition since it absorbed Normoyle Ordnance Depot (East Kelly) during World War II. During negotiations, the name changed from the San Antonio General Depot to Kelly Annex Number 1, or KANNEX, which officially became part of Kelly on July 1, 1955, as the San Antonio Air Force Station. On April 10, 1960, the name KANNEX was dropped officially.

Acquisition of these facilities was significant in a number of ways. The oldest, continually active flying field in the Air Force assumed responsibility for one of the oldest Army depots in the United States; the



(From left to right) Lt Col John Eairley, new KANNEX boss; Col C. Jung, SAAMA's Director of Supply; and Lt Col Philip Melody, Army Commander, in the official transfer of the San Antonio General Depot from Army to Air Force control.

Army initially established the San Antonio General Depot in the Alamo on October 28, 1845.

The complex consisted of 256 acres, 154 buildings with 2.5 million square feet of covered storage space, railroad facilities, and 21.5 miles of paved streets. With the extra warehouses, San Antonio Air Materiel Area was able to remove all property stored in commercial warehouses and close out storage facilities on Pyote AFB, Texas, a Kelly subordinate installation in West Texas.

Kelly's Directorate of Supply and Services also became responsible for storage of household goods for a tri-state area and administered space allocated to Oklahoma City AMA for storage of B-47 and B-52 parts. Kelly storage operations at the San Antonio Air Force Station continued until 1981.

Kelly's Founder Returns

On March 1, 1955, retired Major General Benjamin D. Foulois returned to the site he selected almost forty years earlier as the home of a new aviation center south of San Antonio. Gone were the fields of cotton and small, wooden farm houses. In their place were fields of concrete and a huge industrial complex. Instead of fragile, linen-covered biplanes, massive aluminum-skinned B-36s dotted the ramps.

General Foulois, then President of the Air Force Historical Foundation, was the guest of honor at a luncheon sponsored by the San Antonio Military Historians Council, hosted by SAAMA Commander Major General Thetus C. Odom.

While much had changed at Kelly over the invervening years, the spirit with which early Kellyites maintained, repaired, and flew their aircraft is still very much a part of the ongoing Kelly tradition.

CHAPTER SIX

Logistics of the Cold War

By the middle of the 1950s, the San Antonio Air Materiel Area and the Air Force were well into a period of transition. To a large extent, the fundamental parameters of American strategy were set; deterrence, relying on the bombers of Strategic Air Command (SAC) was the foundation of American defense. But the emergence of new generations of jet aircraft and engines, along with the development of new methods of management, was already altering both the kind and quantity of the depot work load and its ways of operating.

None of these changes took place overnight. Although by the mid-1950s phase out of the huge B-36, the backbone of Strategic Air Command's bomber fleet since the end of the 1940s, was already underway, the giant plane would remain in service until the end of the decade. Likewise, repair and overhaul of the R4360 engines which powered the B-36 would remain an important part of the work load in Kelly's engine shops until 1964. Yet, at the same time, SAC also relied heavily on the all-jet B-47 and began taking deliveries of the B-52 "Stratofortress" in June 1955. For a time, at least, older and newer technologies served side-by-side in uneasy coexistence.

The Coming of the Jets

The B-47 prototype first flew in December 1947, making it a contemporary of such aircraft as the F-84, F-86, and F-89. Designed by Boeing, the B-47 was powered by six General Electric J47-25 engines, carried a three-man crew, and had a range of 4,000 miles. The first operational models began reaching Strategic Air Command units in October 1951.

Since the San Antonio Air Materiel Area was already deeply involved with the B-36 program, responsibility for the B-47 went to the depot at Oklahoma City. But in 1955, Oklahoma City asked San Antonio to assist in performing the regular depot maintenance on selected aircraft. Since mid-1953 the term for this regular depot overhaul was "Modification/Inspect and Repair as Necessary," or mod/IRAN, a shift in terminology which reflected a shift in Air Force maintenance practices from the earlier "disassemble, inspect, and repair" approach. With B-36 work loads shrinking, Kelly's maintenance officials were happy to tackle this new challenge of B-47 mod/IRAN, and promptly requested a typical

The Boeing B-47 was the first swept-wing all-jet bomber in the Air Force inventory.

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B-47s under repair in Kelly's large maintenance hangar.

aircraft to use as a model in developing the procedures and costs for the kind of repair work involved. Unfortunately, SAAMA's maintenance personnel did not get such an aircraft until November 1955, by which time work on three of the first five aircraft scheduled for overhaul at Kelly was already underway. Indeed, the B-47 which did finally arrive was an early model whose configuration was not equivalent to the operational aircraft being repaired. It was useless for establishing standards for the overhaul of later model aircraft, so SAAMA personnel had to develop the necessary standards by trial-and-error while in the midst of the project.

The effort was, however, successful. By the end of 1955 SAC had accepted the standards established by Kelly personnel, and the overhaul of the first B-47s was on schedule. In 1956 San Antonio became a specialized repair facility for the B-47, ensuring a steady stream of the bombers into Kelly's repair shops.

Solving B-47 Repair Problems

When the B-47 first came to Kelly, it posed a series of new and complex problems for maintenance personnel. For one thing, Kelly had little experience with jet aircraft; although San Antonio was deeply involved in developing plans for the logistics support of the F-102 interceptor, the B-47 was the first jet aircraft to undergo maintenance and overhaul at the depot. In addition, the B-47 underwent a constant series of modifications during production; a situation compounded by the fact that production was divided among three manufacturers, Boeing, Lockheed, and Douglas. Each manufacturer built a different series of aircraft, and in many cases the modification kits were not interchangeable. Manufacturing delays hampered the delivery of some kits, too, with the result that occasionally aircraft had to be returned to earlier work stations on the repair line when kits finally arrived. Fundamentally, the difficulties arose from the speed at which modifications to the B-47 went into effect. The drive to get the plane into service, solve the problems which appeared, and improve later models, meant that in some cases modifications to modifications would appear even before an aircraft entered overhaul.

The complexities and intensity of the situation led to the formation of a B-47 mod/IRAN group with representatives from San Antonio, Oklahoma City, Boeing, Lockheed, and Douglas. Meeting at Wichita, Kansas (site of the Boeing plant), the group coordinated as much as possible the delivery of appropriate kits and served as a clearing-house for solutions to difficulties. Such ad hoc groups had long been a way of dealing with large-scale problems, and the growing sophistication of Air Force weapon systems meant that similar groups would appear again in the future.

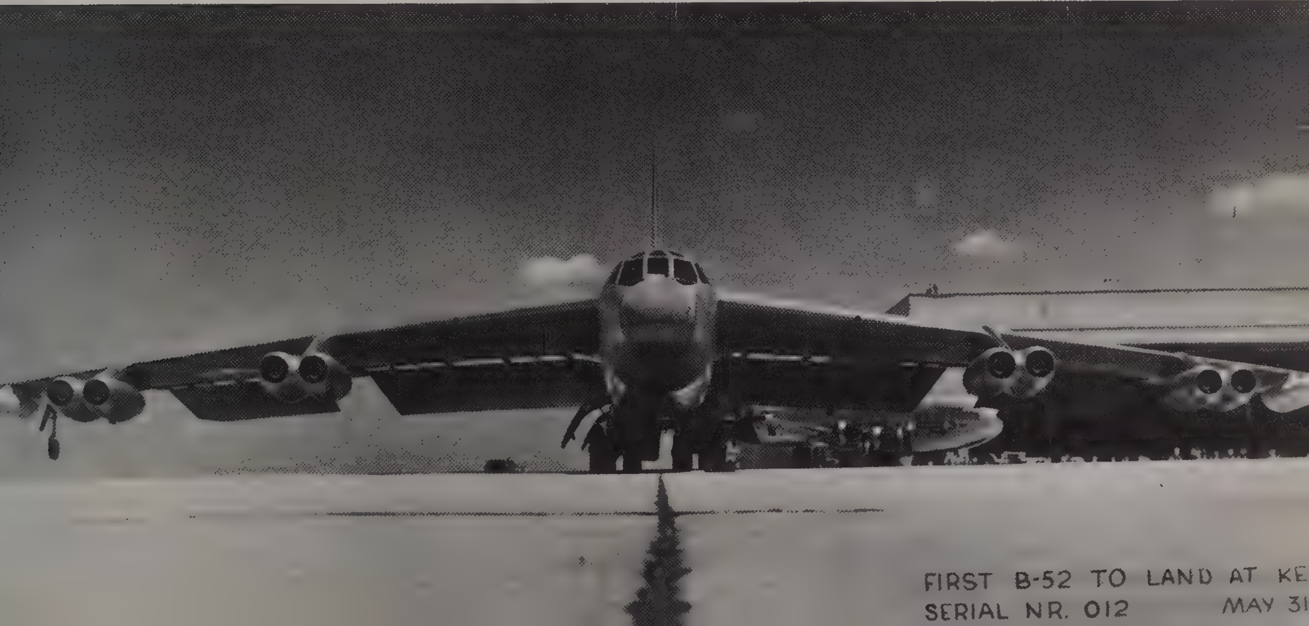
Although originally designed to accommodate the B-36, Kelly's brand new large maintenance hangar was first used to house the B-47 production line. Aircraft entered one end of the huge hangar, at the time the largest free-standing hangar in the world, and progressed along a series of stations. At each station maintenance crews carried out a specific modification or overhaul procedure, deliberately set up to avoid any interference with the work done at other stations. Indeed, as the maintenance teams grew more familiar with the work, and as the flow of necessary parts improved, the number of personnel required on the line was cut almost in half. Unfortunately, perhaps inevitably, just as the B-47s began to flow smoothly through the mod/IRAN process at Kelly, that portion of the SAAMA work load disappeared. Oklahoma City was still the prime depot for the B-47, and, after the completion of the fiscal year 1958 program in March, all future mod/IRAN and overhaul work returned there. But, even if the B-47 program at SAAMA was short-lived, it gave depot maintenance personnel invaluable experience in handling jet aircraft modification and overhaul--experience which was already paying dividends as Kelly's personnel dealt with the brand-new B-52.

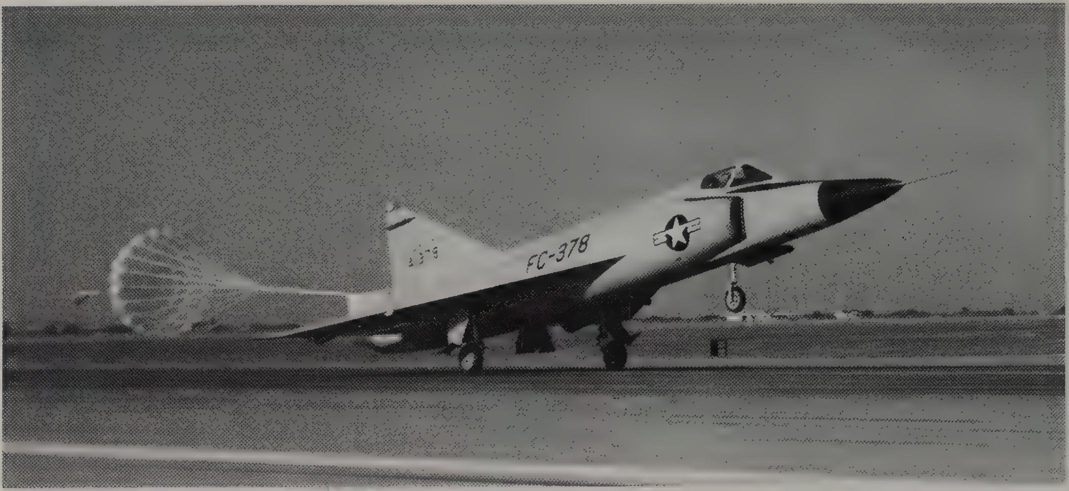
Early Years of B-52 Overhaul at Kelly

The B-52 "Stratofortress" prototype first flew in April 1952. Like the B-47, the B-52 was a Boeing design first proposed in 1945. Although jet bombers were already in development, the high fuel consumption of jets seemed to rule against their use in a long range bomber. Thus, initially the B-52, like the B-36, was to have powerful turboprop engines. By 1950, though, both the improvement in jet engine technology and the tension created by the Korean War led the Air Force to support a redesigned, long-range, jet powered B-52. Well aware of the problems which accompanied the hurried development of the B-47, the B-52 was viewed from the start as a complete weapons package. When the first production model B-52A flew in December 1954, test pilots and observers agreed that it was a superb aircraft. By mid-1955 the new plane was reaching Strategic Air Command wings, replacing the out-dated B-36 as quickly as production allowed.

Prime depot for the B-52 was, as in the case of the B-47, Oklahoma City. In 1952, however, the Air Force assigned specialized overhaul responsibility for the plane to SAAMA, with the Boeing factory in Wichita, Kansas, and Kelly the only sites for overhaul and repair. At the time no one knew that Kelly would still be working on the big bombers thirty-four years

The B-52 began entering the Air Force inventory in 1955.





The F-102 entered the inventory in 1956. This aircraft was used at SAAMA to prototype repair and modification processes.

later, but it was immediately evident that handling the maintenance chores for the aircraft would be a major task. Based on experience with both the B-47 and the C-124, SAAMA maintenance personnel developed a plan, outlining all the necessary steps to carry out B-52 mod/IRAN. A number of maintenance workers spent time at the Boeing plant, too, to become acquainted with the equipment and tooling needed. Others took part in training programs conducted at Kelly on the B-52's systems. Since one key modification was the installation and relocation of electronic countermeasure systems in the aircraft, work which required 2,600 man-hours to complete, training on the electrical system was especially extensive.

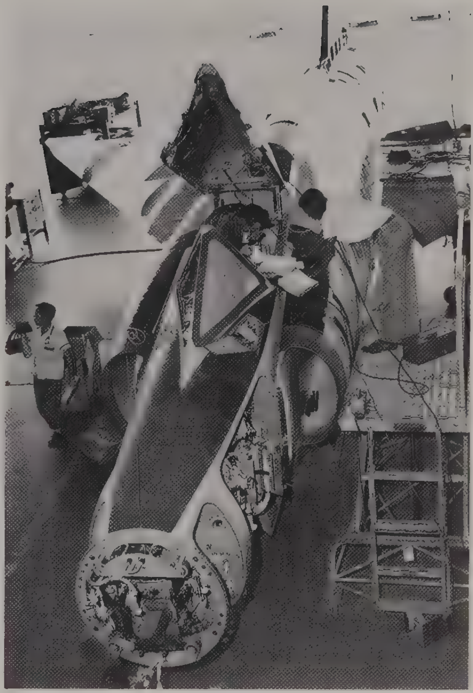
At least half the anticipated work on the B-52s coming into Kelly involved the sheet metal structure of the aircraft. To do this work properly, the plane had to be kept stable, held in place by jigs. The plane could not be moved from station to station like the B-47; workers had to move from plane to plane instead. As they had been during planning for the B-47, SAAMA's maintenance personnel were handicapped for several months by the lack of a suitable prototype aircraft on which they could test their procedures. Instead, they utilized the first aircraft to enter maintenance as a prototype. This plane entered work on May 31, 1956, and was finally ready for flight testing on March 19, 1957. By then, the mod/IRAN program was well underway.

The first B-52 scheduled for mod/IRAN at Kelly entered work in August 1956. Planners anticipated this aircraft would emerge 210 days later, but, in fact, the actual time amounted to 277 days--two months longer than forecast. Reasons for this were varied. The B-52 mod/IRAN program was far more complex than the B-47 program. Kelly workers had to modify the trailing edge of the wings to increase their load-bearing capacity and allow newer, and heavier, engines to be fitted. In addition, maintenance crews modified the leading edge de-icing system, added supports to strengthen the fuselage, modified the chaff dispensing system, altered the drag-angle, internally sealed the fuselage fuel tanks, and made extensive changes to the aircraft electrical systems and ejection mechanisms.

Overall, the complete mod/IRAN package required some 50,340 hours during the first half of 1957, and, considering that Kelly was still new at the B-52 overhaul business, some slippages in the schedule for the first few aircraft was not surprising. Nor did it help matters that delivery of necessary kits and technical data was sometimes late due to problems with the contractor. What mattered most was that, despite the problems, the B-52 program was essentially on-schedule by the fall of 1957. The man-hours spent completing each aircraft was falling steadily as workers grew familiar with what they had to do, and Strategic Air Command was fully satisfied with the aircraft it was getting from San Antonio. Although SAAMA's officials had no idea that Kelly would still be working on B-52s over thirty years later, they were more than pleased with the way the difficulties inherent in the mod/IRAN programs for both the B-47 and B-52 had been met.

The Delta Wing Fighters at Kelly

As Kelly's maintenance teams learned to cope with the mod/IRAN programs for the B-47 and B-52, they were also increasingly involved in similar efforts on behalf of the F-102 interceptor. The F-102 "Delta Dagger" was designed by Convair, the aircraft division of General Dynamics Corporation which also built the B-36. Conceived as a fast, bomber interceptor for Air Defense Command, the F-102 was powered by a single J57-P turbofan jet engine and had a top speed in excess of 825 miles-per-hour. It was the first "delta" wing aircraft built for the Air Force and was also the first fighter designed to carry only missiles and unguided rockets as armament. Although the first prototype flew in October 1953, it took further months of research and modification before the new aircraft met the performance criteria demanded by the Air Force. Along with the change to the J57 engine, designers lengthened the fuselage by seven feet, and modified the fuselage into a "coke bottle" shape. The Air Force did not commit itself to the purchase of the F-102 until early 1954, but by 1956 the first of a total of 875 F-102s were reaching flying squadrons. Eventually, thirty-two Air Defense Command squadrons flew the F-102. Some saw service in Vietnam during the late 1960s, and nineteen Air National Guard squadrons were still flying F-102s in early 1976.



Under the Cook-Craigie procurement plan, early models of the F-102 had to be modified into their final tactical configuration.

The Air Force bought the F-102 under a program of simultaneous procurement and development known as the Cook-Craigie plan after its sponsors, Major General Laurence C. Craigie, Deputy Chief of Staff for Development, and Major General Orval R. Cook, Deputy Chief of Staff for Materiel, during the late 1940s. The plan envisioned the use of the first thirty production aircraft as test models. Needed modifications would then be worked into the later production aircraft, with the first thirty modified to bring them up to standard. The purpose was to get vital weapon systems into production quickly, ironing out problems along the way as they appeared. It had the virtue of eliminating the time and cost of building and evaluating a series of prototypes, but it depended, as both generals admitted, on having a design that was essentially ready for production. When substantial changes had to be made, the costs rose dramatically, and this was certainly true in the case of the F-102. The modifications required after the testing of the first prototype in 1953 forced Convair to discard two-thirds of the tools already purchased for production, threw the production schedule into disarray, and complicated further the planning for depot maintenance and mod/IRAN of the aircraft.

From 1953 to 1957, Air Materiel Command negotiated five separate procurement contracts with Convair, all of which were administered by the San Antonio Air Materiel Area. Almost two-thirds of the aircraft were procured under the 1956 contract, with most actually coming off the Convair assembly line during 1957. Since the F-102 was conceived from the start as a complete system, logistical support was critical. San Antonio provided this support under the Weapons System Support Concept, a new management concept under which a single depot handled all aspects of support for a particular weapon system. The F-102 was the first weapon system supported under this concept (the codename for the pilot project was Delta Cover), and despite some problems Air Materiel Command decided in November 1955 to extend the idea to support all tactical aircraft. Although it represented something of a new direction in weapon system support, the idea that a single depot should control all the support for a specific weapon system was actually the logical result of a trend already underway within Air Materiel Command since the early 1950s. Its impact would be felt even more strongly with future weapon systems, for which the San Antonio Air Materiel Area experience with the F-102 would prove a valuable guide.

SAAMA Support For the F-102

The original support plan developed for the F-102 was based on the premise that support for the flying squadrons would follow the familiar wing-base support concept. Air Defense Command objected to this, however, on the basis that the squadrons flying the F-102 would be deployed in ones and twos on bases around the globe. This type of deployment, required by the need to maintain an effective air defense over a wide area, together with the need to sustain the maximum possible readiness rate, required maintenance and support equipment be controlled by the squadron commanders. Procurement of necessary support equipment was already underway by the time a tentative table of equipment was approved in September 1956.

In theory, San Antonio supported the conversion of Air Defense Command squadrons from the F-86 to the F-102 (or the activation of a new F-102 squadron) by prepositioning equipment on each F-102 base sixty days before the first aircraft arrived, and by supplying technicians to each base thirty days before the aircraft arrived. These technicians would remain at the base for a further sixty days after the arrival of the new aircraft to assist in performing field modifications and training local maintenance personnel. In practice, it proved exceedingly difficult to preposition equipment the way planners envisioned. Although Air Defense Command was supposed to notify SAAMA 180 days before the arrival of F-102s at a new location, San Antonio often got word with far less time than this to prepare. In addition, the only time equipment was even ready for prepositioning was when Convair was ahead of schedule in delivering ground support equipment or spares. Convair was not, in fact, required to deliver any of this materiel ahead of time and usually did not. The fact that the F-102 was constantly being modified simply added to the difficulty of procuring appropriate equipment ahead of time. Nevertheless, by the end of 1957, SAAMA had managed to preposition spares at thirteen Air Defense Command bases.

The 182nd Fighter Interceptor Squadron at Kelly was the first Air National Guard unit equipped with the F-102.

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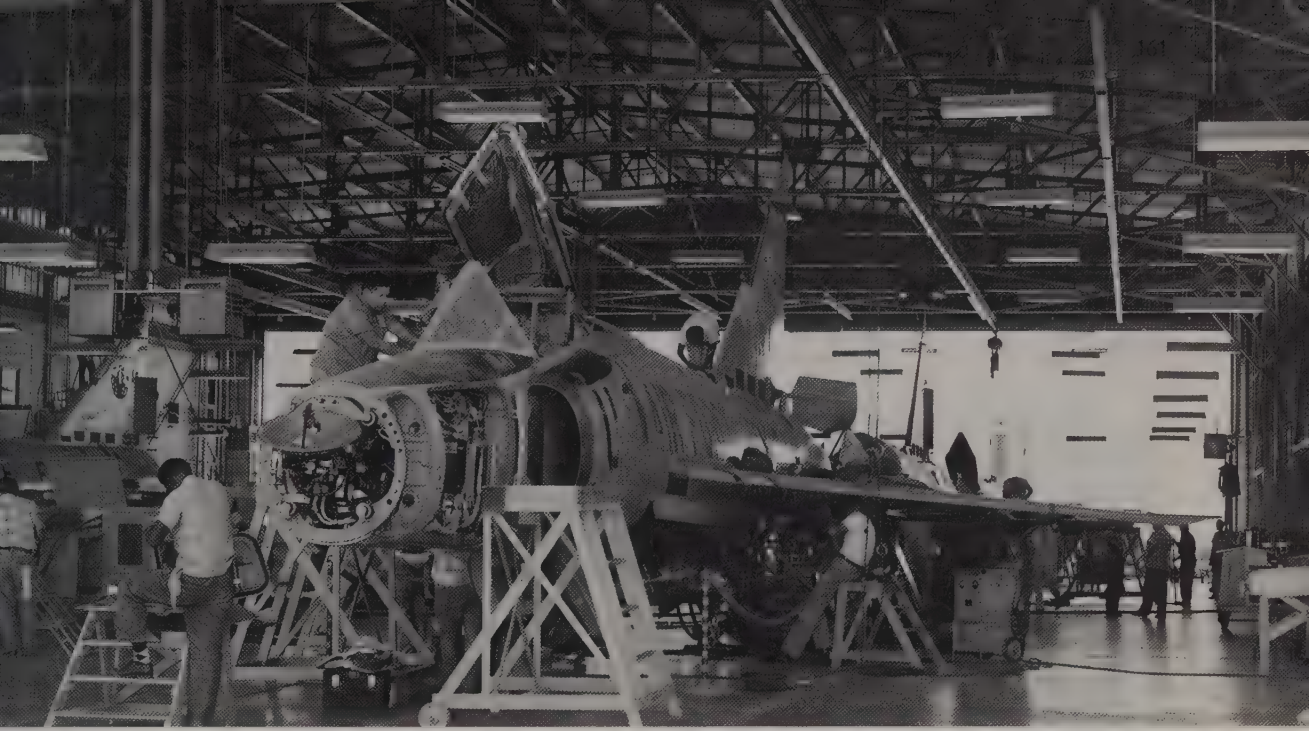

F-102s undergoing mod/IRAN at Kelly.

F-102 Mod/IRAN Programs

Under the procurement plan for the F-102, the first fourteen aircraft were to remain in the test program while the next eighteen aircraft would eventually be modified to match a standard configuration--theoretically established with the thirty-third aircraft produced. In this event, even a tentatively firm configuration was not reached until the 354th aircraft on the line, delivered in May 1957. Modifying the aircraft even to this tentative standard (which did not include the electrical automatic attack and landing systems) involved the incorporation of twenty-two engineering change proposals along with the installation of the electronic attack and landing system components. Although Convair hoped to handle the entire work load at its Fort Worth, Texas, facility, Air Materiel Command opted to have the load spread over four depots as well. Complicating this decision was the fact that spares and tooling existed for a maximum of three sites, not five. It was also virtually impossible to determine the proper mix of parts to order, since by now there had been 629 engineering change proposals, seventy-two technical order modifications, and 31,000 design changes during production. Every F-102 was in some way unique, and the depots had to stock an enormous variety of items.

Despite these handicaps, by the end of 1958 the F-102 mod/IRAN effort was largely back on track. Kelly's maintenance teams completed sixty-three aircraft, more than any other single facility, and only three short of the two year program goal at SAAMA. At the same time, SAAMA officials were working behind the scene to shift the responsibility for both F-102 depot overhaul and component repair to the Mobile Air Materiel Area in 1961 enabling Kelly to handle more efficiently the depot overhaul of other aircraft.

The San Antonio Air Materiel Area overhauled its last F-102 as a specialized repair activity in October 1960. It was the 505th F-102 to pass through Kelly's shops, and over the previous four-and-a-half years SAAMA's maintenance and management specialists had contributed enormously to the aircraft's ultimate success as a weapon system. The difficulties were enormous. Constant modifications to the F-102 throughout production placed unusually heavy strains on the aircraft maintenance program. At one point, essentially brand-new aircraft were entering mod/IRAN, far ahead of any need based on actual deterioration. The only justification was the paramount need to upgrade these aircraft to the most recent configuration, a standard that in fact changed several times over the production run. During 1957 and 1958, SAAMA officials estimated that upwards of eighty-five percent of the mod/IRAN effort was devoted to modification rather than repair. Indeed, at times the modification process was so extensive that SAAMA's maintenance teams were rebuilding essentially the aircraft from scratch. Monetarily this was expensive, and the cost was increased by the need to rely on Convair for development of most major modifications and for much of the technical data.

But there were valuable lessons to be learned, too, particularly the need to develop accurate work specifications from the start. And, SAAMA's workers could take pride in the high degree of effectiveness and efficiency they reached in handling what was admitted widely as a difficult program. The F-102 went through four separate maintenance/overhaul programs at Kelly, with SAAMA also overseeing the contract team maintenance program. And, in accomplishing the airlift and wing repair program, SAAMA helped save millions of dollars. This was an important success, and testifies to the effort made at Kelly on behalf of the F-102. Despite the problems, SAAMA did well.

Even after the Mobile Air Materiel Area began handling the depot overhaul and mod/IRAN of the F-102, specialists at Kelly continued to manage the aircraft through the end of its service life and beyond. As the F-102 disappeared from the active inventory in the early 1970s (only two Air Defense Command squadrons still flew it by 1971, even though nineteen Air National Guard squadrons were equipped with it), SAAMA took on the task of logistically supporting the conversion of up to 150 Delta Daggers into remotely controlled targets. The project, managed by Air Force Systems Command, was nicknamed Pave Deuce, and by 1974 eight aircraft had been modified. Three could still be flown by a pilot aboard the plane; the others were flown solely by remote control. Even before testing was complete, the Air Force enlarged the program to 132 aircraft for Air Force use and seven for the Army (as targets for ground-to-air missiles then in development). By the end of 1977, sixty-nine aircraft had been modified, with twenty-four either used as targets or destroyed in crashes. Overall, both the Air Force and the Army were pleased with the program, which provided a reasonably economical, full-size, supersonic, manuevering target. During the early 1980s, the Air Force contemplated converting the remaining F-102s stored at Davis-Monthan Air Force Base in Arizona, but opted to convert retiring F-106s instead.

Kelly stopped handling F-102 mod/IRAN in 1961.

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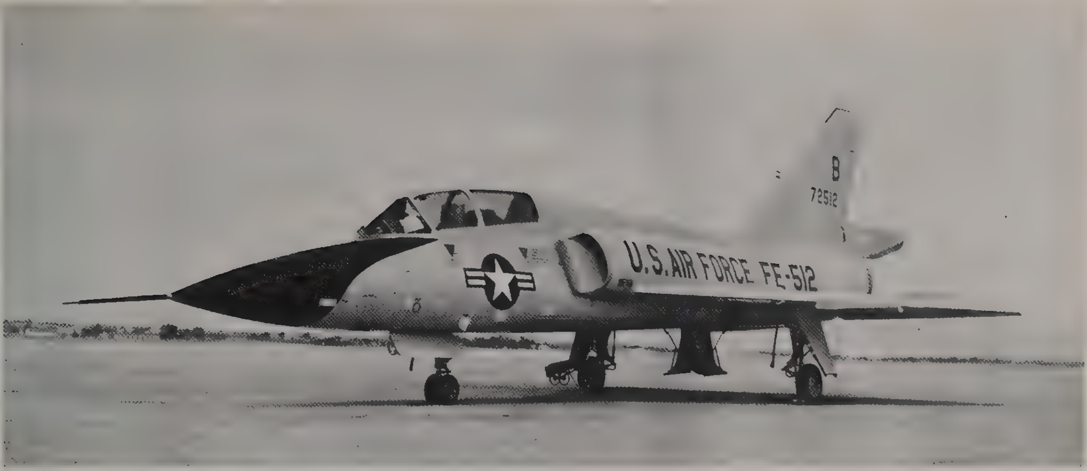

On October 24, 1958, this two-seat F-106B became the first F-106 to touchdown at Kelly.

The F-106

The F-106 "Delta Dart" began as an improved model of the F-102 in 1955. It was, in fact, originally designated the F-102B. Powered by a J75 engine with fifty percent more thrust than the J57 of the F-102, it first flew in December 1956. By then, the Air Force was committed already to production under the Cook-Craigie procurement plan. Deliveries to Air Defense Command squadrons began in July 1959, and ultimately, the Air Force bought 341 aircraft under four production contracts, the last three of which were highly controversial fixed-price-incentive-fee contracts. Procurement officials hoped that these contracts would lead to a higher quality product for less money, but in fact the sliding scale of profit allowed under these contracts resulted in far higher costs. Moreover, the F-106 was developed before all the problems with the F-102 were solved. Like its predecessor, the F-106 underwent almost constant modification. Getting it from "the drawing board to the sky," wrote SAAMA historian Jesse Scott in 1960, "proved a hard and hazardous task."

As the logistic support manager for the F-106, SAAMA was involved in the program from the start. San Antonio personnel computed the requirements for support equipment, budgeted for parts and repair, stocked and supplied parts to other repair locations, and oversaw everything from procurement through modification and repair of the aircraft. Considering that procurement, testing, manufacture, and modification were going on simultaneously, this was a tall order, and in many ways the story of the F-106 echoes that of the F-102. Both programs suffered from a large number of design changes during production which made it difficult to stockpile the appropriate spares; neither produced an aircraft with which the Air Force was particularly pleased.

San Antonio's main effort on behalf of the F-106 involved management, not repair. In the beginning the contractor did most of this work. Indeed, even before agreeing to accept the first five production F-106As or the first three F-106B (two-seat) test aircraft, Air Defense Command requested an upgrade. The upgrade included nine engineering change proposals along with installation of a more powerful engine, and all the changes were incorporated into subsequent production models. At the same time, the Air Force decided to modify the test aircraft to the existing tactical configuration. This program, known as "Test-to-Tact," was developed by SAAMA engineers but carried out by Convair. Unfortunately, even though money was provided to fund part of the modification program, the program itself was not approved until three months after the deadline to begin the acquisition of parts kits. In the meantime, the contractor for the automatic weapon control system, Hughes Aircraft Company of California, increased its lead-time requirements, increasing the total cost by nearly forty percent. Air Materiel Command eventually provided the funds, and the program began in Janaury 1960.

However, at the same time that the "Test-to-Tact" program was underway, a series of additional modification programs also began. One, called "Wild Goose," was intended to reduce the number of fire control configurations from seven to two. Another, "Broad Jump," was carried out by the Sacramento Air Materiel Area (designated as the site for depot overhaul and mod/IRAN in 1959). A fourth modification program, "Dart Board," was to carry out urgent modifications, ignoring all maintenance work or less urgent modification. With all four programs underway during 1961, parts provisioning became a nightmare. Numerous problems with F-106 subsystems continued to surface; Convair complained bitterly about alleged shortages of government furnished equipment; Air Defense Command was disenchanted increasingly with the aircraft.

Survivability Issues

When the F-106 first entered production, it seemed possible that it would be the last manned interceptor; the future seemed to belong to missiles and spacecraft. By 1962, if that notion had not entirely disappeared, it was certainly less dominant. For the foreseeable future at least, the Air Force would have to rely on a manned interceptor. While the F-102 would remain in the inventory, it was not the aircraft to fill the bill. That left the F-106 as the only available aircraft to carry out air defense until the early 1970s. The result was the Interceptor Improvement Program intended to provide Air Defense Command aircraft with the ability to fight and survive in an environment of increased reliance on electronics. At the same time, Air Defense Command criticisms of the F-106, especially incomplete testing, led to a Service-Revealed Deficiency Test Program, run by SAAMA at Holloman Air Force Base, New Mexico.

The Interceptor Improvement Program actually consisted of five major improvement modifications and six less complicated retrofit modifications. Five of the major modifications, and all of the retrofits, applied to F-106s, and included installation of infrared sensors, parametric amplifiers, new antennas, and electronic countermeasure devices. Kelly was responsible for ensuring the funding of these programs and handled the task of coordinating the activities of all the involved agencies through quarterly meetings. Tests of modified F-106As began in January 1961, with final approval to go ahead with fleet-wide modifications in November. San Antonio personnel immediately initiated the purchase of the needed kits, and Sacramento handled the depot modification work.

Most of these modifications were complete by 1963, although improvements to the F-106 continued, largely on the basis of results of testing done in the Deficiency Test Program. Among the changes which came from this effort was the installation of a supersonic ejection seat. The program, managed by SAAMA, continued under contract with General Dynamics as the Service Engineering Test Program at Holloman until 1970. Among the last major modifications to the F-106 was the addition of air-to-air refueling recepticles in 1968, but there were continuous upgrades of the electronic systems. Improvements like this allowed the F-106 to continue to serve into the 1970s, although the number of aircraft in the active inventory declined rapidly after 1972. Eleven active squadrons flew the plane in 1972; six in 1974, along with six Air National Guard squadrons. In the mid-1980s, three air divisions of Tactical Air Command, and four national guard squadrons still flew F-106s, with the last Delta Dart leaving the inventory in 1988. Like the F-102 before it, the remaining F-106s were programmed to serve as remote controlled target drones.

The Hustler

The initial requirement for what would become the B-58 bomber came from General Curtis LeMay, commander of Strategic Air Command, in 1947. At that time, designers saw the future bomber as a refinement of the B-36. No jet powered bomber, given the state of jet engine development in the late 1940s, could meet the Air Force requirement for a heavy bomber with a combat radius of 2,500 miles. By 1951, however, improvements in jet engine technology were leading Convair engineers toward the design of an all-jet, supersonic bomber. In competition with Convair, Boeing also developed a bomber design (distinct from the B-52 which was being built), but in the fall of 1952 the Air Force opted for the Convair aircraft--already nicknamed the "Hustler."

Like the F-102, which was under development, and the later F-106, the Air Force bought the B-58 under the Cook-Craigie concept. The normal practice of building a prototype and testing it to see what flaws existed was expensive and took time, both in short supply in 1952. The procurement of the B-58 did,

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The B-58 Supersonic Bomber

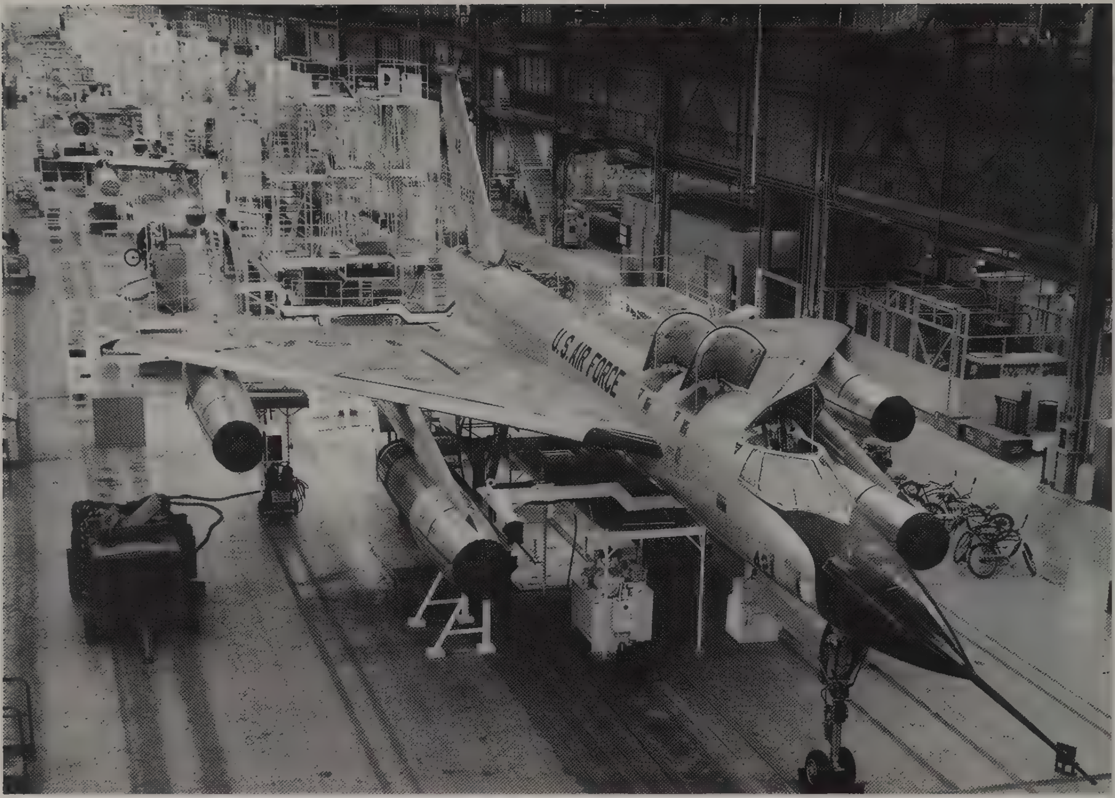
however, differ slightly from that of the F-102. While the contract for the F-102 combined production, research, and development, the contract for the B-58 was for thirty test aircraft.

By delaying full production until the end of testing, the Air Force undoubtedly hoped to avoid many of the problems encountered in the F-102. In addition, there was still debate over the need for the B-58; during most of the early period of the aircraft's development, Strategic Air Command and General LeMay argued that the B-58 was not needed. Unhappily, this hope was not realized. Like the other Convair delta-winged aircraft programs, the B-58 ran into numerous problems, attributable to both the daring novelty of their design and the speed with which new, untried technology went from design to production. Indeed, Convair was still in the process of developing a firm design configuration when the Air Force agreed to buy the B-58. Three further design configurations of the aircraft appeared before Convair and the Air Force settled on a final one in September 1954.

As it finally emerged, the B-58 was a delta winged aircraft, just under ninety-seven feet long, with a wingspan of just under fifty-seven feet. Four General Electric J79 turbofan engines powered the bomber, which had a top speed over 1,380 miles-per-hour and carried a three-man crew. In contrast to other current bombers, which carried their bomb load in an internal bomb bay, the B-58 carried its load in a specially designed pod slung below the fuselage. The pod could carry either nuclear weapons or electronic countermeasure devices to assist other bombers in penetrating enemy defenses. Production was finally approved in 1955, and the first B-58 prototype flew in November 1956. The first operational models began reaching the 43rd Bomb Wing at Carswell Air Force Base, Texas, in August 1960, although the wing did not have its full complement of aircraft until May 1961. At that time, the 305th Bomb Wing at Bunker Hill Air Force Base, Indiana, began receiving its first B-58s. Ultimately, the Air Force purchased 116 B-58s, but only the 43rd and 305th Bomb Wings were equipped with them.

SAAMA and the B-58: Early Involvement

San Antonio's involvement with the B-58 officially began in March 1955, when SAAMA was designated the "lead" air materiel area for the new plane, acquiring both prime and specialized repair responsibility



B-58s progress along the assembly line at Convair's Fort Worth, Texas, factory.

at the same time. Under the weapon system concept, an attempt to streamline procurement and simplify management by giving a single manager the responsibility for all the component systems and subsystems of a new weapon, Air Research and Development Command (ARDC)--the forerunner of Air Force Systems Command-- worked in partnership with Air Materiel Command during the early stages of development. While Air Research and Development Command retained the responsiblity for developing design criteria and overseeing the testing, AMC handled management of contracts, developed maintenance specifications, and coordinated with ARDC on the testing. As the lead AMA, San Antonio took on these responsibilities, with one of the first steps being the creation of a logistics support plan for the test phase of the B-58 program, codenamed Project White Horse. By early 1956, SAAMA also had a full-time representative at the Convair plant in Fort Worth, Texas, and had created a B-58 Control Group to coordinate supply, procurement, and maintenance activities at Kelly.

Under the weapon system concept as it applied to the B-58, Convair handled design and engineering tasks, and dealt directly with subcontractors in acquiring major components. Thus, the Air Force had to provide a minimum of equipment and its role became largely one of monitoring Convair's plans and progress--and supplying the money. Much of Kelly's effort in the early stages revolved around developing estimates of the quantities of material needed, and the cost of that material, through negotiations with Convair.

Instead of spreading the test program among several bases, it proved more economical for Convair to conduct the testing at their Fort Worth facility adjacent to Carswell Air Force Base. Phase I of the test program began in November 1956, and revealed a number of problems. Malfunctions in the fuel system impaired the B-58s stability; afterburner problems resulted in yawing at high speeds; the prototype engines vibrated excessively, exacerbating acoustical and sonic fatigue of the fuselage and contributing to the appearance of cracks along rivet lines on the forward section; the brake system failed to perform adequately, leading to frequent tire failures; and the ejection system was unsafe at high speed. More ominous were problems with the bombing and navigation system under development by the Sperry Gyroscope Company. Indeed, the number of problems uncovered during flight testing led the Air Force to consider cancelling the B-58 in 1958 and early 1959, but it eventually decided simply to limit procurement to the aircraft for two wings, no more.

Early Modification Programs

At the time the B-58 was entering the inventory, Air Force leaders believed that maintenance work loads should be handled as much as possible by the air materiel areas. Contract maintenance was to be used only when work loads exceeded the capacity of existing Air Force operated facilities or if the repair of some complex items required unique and expensive equipment which no Air Force facility possessed. During 1958 SAAMA officials--working with people from several other AMAs, Convair, and Convair's subcontractors--conducted a "Best Mix" study to determine the most economical and efficient assignment of B-58 repair and overhaul tasks. The resulting plan, approved by Air Materiel Command in June 1959, identified twenty-nine specialized repair activity assignments, ranging from the overall aircraft structure to subsystems such as the oxygen system and drogue parachute braking system. Responsibility for twenty-three of these assignments went to SAAMA, although by 1961 Kelly still lacked organic capability for seven of them.

Training occupied SAAMA's Directorate of Maintenance during the final months of 1959 and all of 1960. In March, SAAMA obtained the first production B-58 to serve as a testbed for maintenance procedures. Kelly was ready by 1962, but ironically Strategic Air Command decided it could not spare the aircraft for the length of time involved in repairing or modifying them at a depot. Kelly's

Hustlers undergoing modification during the early 1960s.

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maintenance teams thus traveled to the aircraft to perform modifications. B-58s did not actually enter maintenance shops at Kelly until late 1962, when SAAMA, in conjuction with Convair, began a major modification program called "Hustle-Up." This project involved modifying the fleet of test aircraft to the tactical configuration through the installation of multi-weapon carrying capacity and an improved ejection system. San Antonio's share of the work load amounted to thirty-six of the fifty-six aircraft modified in the first phase and twenty-six of the thirty-six aircraft modified in the second phase. Not surprisingly, given both a lighter work load and greater experience with the B-58, Convair finished its portion of the Hustle-Up project quickly. Kelly had trouble at first, mainly due to incorrect interpretation of engineer drawings and the acceptance of incorrect modification kits, but rapidly caught up. By the end of the program in May 1964, sixty-four aircraft had passed through maintenance for one modification or another.

Management Support Efforts

Beginning in late 1961, Strategic Air Command complaints about the logistical support of the B-58 brought about a SAAMA-developed program called "Pull-Out," intended to eliminate a shortage of parts at B-58 bases. Under a contract awarded in April 1962, General Dynamics (the parent company of Convair) began producing increased numbers of modification kits and other spare parts. Inventory managers monitored supply levels constantly in an effort to maintain adequate stocks in the field. The effort was intense, yet recovery was slow. Initially expected to run only six months, Pull-Out actually continued until the end of 1963, by which time support had improved dramatically.

Later Maintenance Programs and Phase Out

In 1965 and 1966 only a handful of B-58s entered maintenance facilities at Kelly. General Dynamics continued to perform most of the modification and overhaul work at its Fort Worth plant. From the start, SAAMA planners estimated that B-58 depot overhaul or mod/IRAN would begin about 1966, but by 1965 routine inspections uncovered a number of critical problems. Plumbing and wiring on many of the bombers was deteriorating rapidly, and numerous aircraft had visible evidence of metal fatigue and corrosion. Kelly maintenance officials urged an immediate start to depot repairs, and in early 1966 B-58s of the 43rd Bomb Wing began entering a comprehensive mod/IRAN program at Fort Worth and later at James Connally Air Force Base outside Waco, Texas. However, even as this repair effort got underway, Secretary of Defense Robert S. McNamara announced that the B-58 would leave the active inventory by mid-1970. The bomb and navigation system was still not operating reliably, and improvements suggested by various contractors carried price tags that were far too high. Strategic Air Command protested briefly, hoping to preserve the size of its manned bomber fleet, but, once it began, the retirement of the B-58 went faster than scheduled. The last two B-58s of the 305th Bomb Wing flew to Davis-Monthan Air Force Base, Arizona, in January 1970.

An Engine Depot

Ever since the establishment of the San Antonio Air Intermediate Depot in 1921, a hefty proportion of Kelly's overhaul effort had been engines. In the beginning, most of these engines were Curtiss OX varients used in the "Jenny" trainers or Liberty engines, which powered the DH-4s and Martin MB-2s flown by the border patrol squadrons. By the early 1930s, the Duncan Field engine shops handled engines like the V1150 of the Curtiss P-1 "Hawk" and the Pratt and Whitney R1340 of the nimble Boeing P-12 biplane fighter. This was the first Pratt and Whitney engine used by the Air Corps, beginning a relationship between Pratt and Whitney, the Air Force, and Kelly which has continued to the present.

The engine work load expanded enormously during World War II. At one time or another, nearly every type of aircraft in the inventory passed through the Duncan Field maintenance shops--and so did the engines which powered them. Engine specialists already were familiar with the Pratt and Whitney R1830 of the P-36. Four of the same engine powered the B-24 Liberator, while two served as the powerplants for the C-47. By 1945, though, the heaviest engine load at Kelly (reunited with Duncan Field in 1943) consisted of the R3350, powerplant of the B-29, and the R2000 engine of the C-54 transport. Kelly became the primary overhaul site for B-29s

A pair of civilian mechanics work on a Liberty engine in a Duncan Field outdoor test cell during the 1920s.

bound for the Pacific in July 1945 and, by operating the test blocks around the clock, seven-days-a-week, turned out 450 engines a month.

Engines in the Postwar Years

The end of the war brought an immediate cutback in work loads of all types at Kelly, including engines. Most of the effort which continued was in support of the R2000 engine of the C-54, with a proportion of the necessary equipment coming from the Ogden Air Technical Service Command. Briefly delayed by budgetary restrictions, Kelly engineers installed a monoveyor system in 1946 which carried engines through a series of disassembly stations. At each station along the 2,150 foot stretch of the monoveyor engine workers disassembled specific portions of the engine, placing smaller parts in baskets and hanging larger parts on hooks so they traveled along with the engine. All the parts were identified with metal tags. Near the end of this process, the disassembled engine (together with all its component parts) traveled through 643 feet of solvent baths and rinses which stripped off grease and dirt. After this, the engines were inspected, condemned parts removed, and the remainder went into rework and reassembly.

Use of the monoveyor immediately speeded up engine overhaul from fifty to seventy-five engines per eight-hour shift. One problem, however, was that the solvents not only took the grease off the engines, they took it off the moving parts of the monoveyor, too. Until Kelly engineers could develop an automatic lubricating system, workers had to manually grease the monoveyor wheels as they emerged from the solvent bath. A second problem was unforeseen at the time. The monoveyor was in operation until the 1970s, by which time it was better known as the "Green Worm," and over the years it spilled thousands of gallons of solvents and other residue on the ground. A later generation, more conscious of the environmental impact of maintenance operations, would be left with the task of cleaning up the decades of spill. This was an unwanted side-effect and an expensive legacy.

The "Green Worm" engine part cleaning monoveyor speeded up engine repair, but at an environmental cost.

Overhaul of the R4360 "Wasp Major" was a Kelly mission throughout the 1950s. The rows of cylinders are clearly visible in this photograph.

R4360

By the time the monoveyor was running, Kelly's engine facilities were also preparing to handle the depot overhaul of the R4360 engines, which powered the B-36 and its unique transport cousin, the XC-99. Nicknamed the "Wasp Major," the R4360 was a huge engine--four rows of seven cylinders, staggered just enough to allow cooling air to flow from front to rear, capable of 3,000 horsepower. Designed in the early 1940s, the R4360 was reliable in the air, but its complexity made it difficult to deal with on the ground. The shutdown procedure for engines on the B-36 took six hours; start-up took four. Troubleshooting was equally time-consuming. Bendix, for example, developed an engine analyzer which could check nearly every aspect of a running engine, but using it on the R4360 involved connecting fifty-six wires per engine for the spark plugs alone. It was one of the few engines which could be shutdown in perfect condition and have problems the next time it was started.

Despite these shortcomings, its virtues of power and low torque led to the use of the R4360 on several Air Force aircraft. They were installed on a variant of the B-29 called the B-50 and served for years as the powerplant of the Douglas C-124 Globemaster. There was no shortage of engines needing overhaul, and throughout the 1950s and into the 1960s it made up the lion's share of Kelly's engine work load. It also forced a major facility construction effort, including complete modification of test cells. Among other changes, special ramps and dollies had to be constructed to hold the big engine in a vertical position during testing.

From Operation Vittles to First Jet Engines

Overhaul of R4360 engines was just beginning when, in June 1948, the Soviet Union halted overland travel into the jointly occupied city of Berlin. In response, at the immediate order of President Harry S. Truman, the Western Allies began an airlift of vital supplies into the isolated city. Known simply as the Berlin Airlift, nearly every available transport quickly was included in the around-the-clock shuttle. This included veteran cargo haulers like the C-47, along with five C-82s, a single C-74, and a lone C-97. But the backbone of the American airlift fleet was the

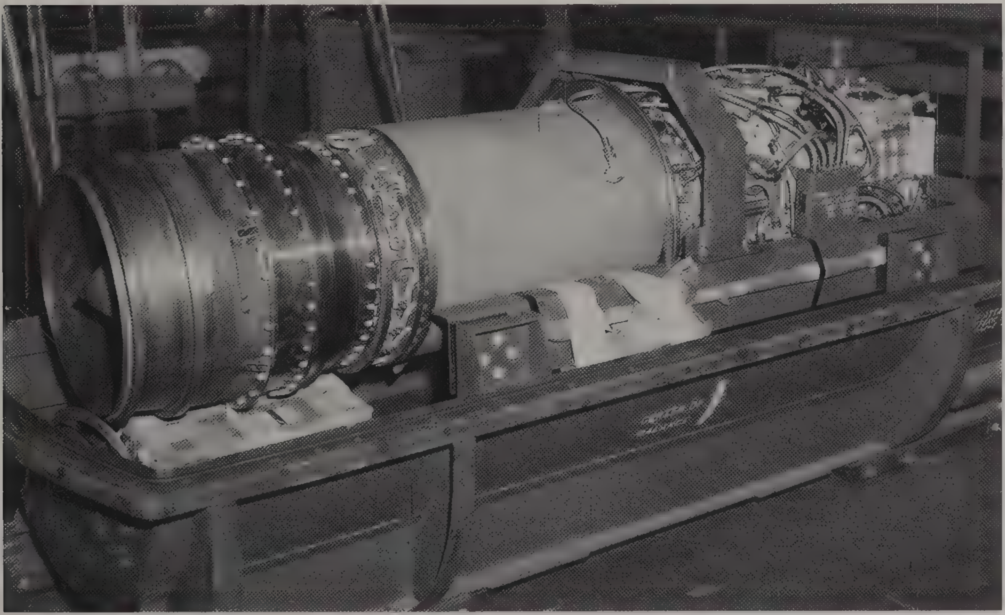
C-54 (known as the R-5 by the U. S. Navy, which supplied two squadrons to the airlift). Flying day-and-night, the strain on the R2000 engines which powered the C-54s was enormous. To meet the demand, Kelly's engine shops doubled production of R2000 engines, using two shifts for a time and working seven days a week. Even when the Soviets lifted the blockade in May 1949, the airlift continued, with the last C-54 coming into Berlin on September 30. It was an unprecedented achievement, and Kelly's contribution was even more remarkable considering that the number of R4360 engines coming off the overhaul line also doubled.

Kelly engineers also pioneered the storage and shipping of engines with the development of pressurized containers, used instead of wooden packing crates. This new process, introduced in July 1949, eliminated the need to inspect packed engines every month. Initially used for the R4360, containers were soon used for all engines. Engineers also found a low dust alternative to the usual abrasives used in air-blasting engine parts: crushed pecan shells. It was an effective process, too, however odd it seemed at first. Kelly's overhaul of the R4360 ended in March 1964, but the big engine remained a management responsibility well into the 1970s.

The First Turboprops

By 1953 it was clear that jet engines represented the future in terms of aircraft propulsion. Even though Kelly's engine shops were still concentrating on the R4360, other reciprocating engines were beginning to disappear. In July 1953, for example, overhaul of R2000 engines was turned over to a commerical contractor, the Spartan Aircraft Company of Tulsa, Oklahoma (which, after briefly losing the contract to an Oakland, California, firm, was still overhauling the engine in the 1960s). A month later, Air Materiel Command designated Kelly as a minor repair activity for a series of jet engines: the General Electric J33 used in the F-80; the Allison J35 used in the F-84B and F-89; the General Electric J47 used in the B-45 (the first four-jet U. S. bomber), the F-86 "Sabrejet," and the B-47; the Pratt and Whitney J48 used in the F-94; the General Electric J57 used in the B-52; and the imported Curtiss-Wright J65 used in the F-89F. For some time, though, Kelly's role in handling these engines was limited to testing, minor repairs, and management.

The first "jet" engines which came to Kelly for full depot overhaul were actually turboprop engines: the T34 of the C-133 and the T56 of the C-130. The first T34 came to the depot in April 1957, with the first



The first T56 "turboprop" engine to enter Kelly's shops arrived in November 1955. Engineers used it to prototype repair procedures.

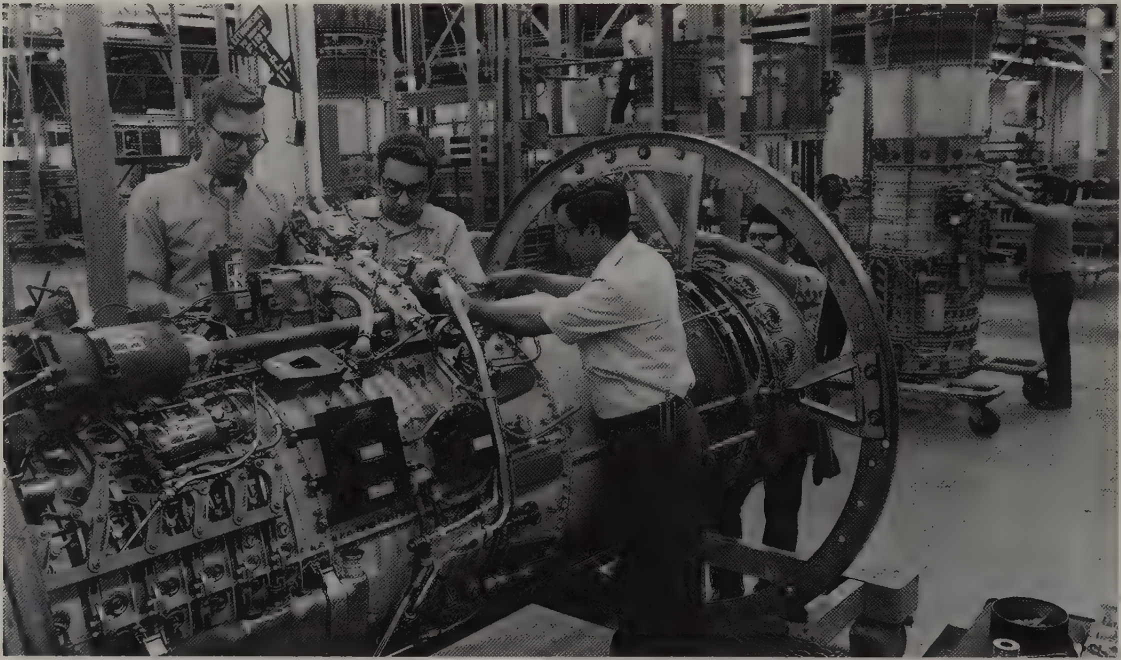
T56 arriving at Kelly in November 1955. Production of both types rose rapidly, concurrent with a steady lowering of demand for the R4360 as the B-36 began phasing out of the inventory. Production of the T34 went from four in 1958 to 337 in 1960, while during the same years production of T56 engines went from 52 to 865. As these numbers make clear, demand for the T56 was greater than that for the T34. By 1966, Kelly was producing 1,419 T56 engines, and the T34 was slowly disappearing from the depot shops. The last T34 came off the engine line at Kelly in December 1970, but the rugged reliability of the C-130 created a steady demand for T56 overhaul for two more decades.

The True Jets

Although Kelly had served as a minor repair facility for a number of early jet engines, the main emphasis had been on inventory management. The first true jet engine overhauled at Kelly was the General Electric J79, powerplant of a number of aircraft, including the F-104 "Starfighter" and the F-4 "Phantom," which first arrived at SAAMA in October 1967. Overhaul of the J79 normally was done at the Oklahoma Air Materiel Area, but that depot was having difficulties in keeping pace with the demand brought on by the increasing air war in Vietnam. To assist, Kelly's engine shops began overhauling J79-15 engines in 1967. Eight years later, Oklahoma City was still having difficulties, so in the early fall of 1975, San Antonio took over all repair of the J79-17 as well. Indeed, overhaul of J79 engines at Kelly did not come to an end until September 1983. Planning for return of this work load to Oklahoma City actually began in 1981, with that depot becoming the repair site for the J79-15 in mid-1982. San Antonio retained the J79-17 work load for a further fifteen months. And, by this time, Kelly's maintenance personnel were already deeply involved in repairing two newer jet engines which would remain the core of the engine repair work load at the depot into the 1990s--the TF39 of the C-5 and the F100 of the F-15 and F-16.

The TF39

Powerplant of the Lockheed C-5, the General Electric TF39 is a high-bypass turbofan engine (indicated in the TF designation), developed in the mid-1960s and providing over 41,000 pounds of thrust. San Antonio became both the manager of the TF39 and the specialized repair activity for the engine on September 15, 1966. The T34 engine disappeared from Kelly's repair lines; workers assigned to it could now devote themselves to the TF39. The first TF39 entered the overhaul line in October 1970. In

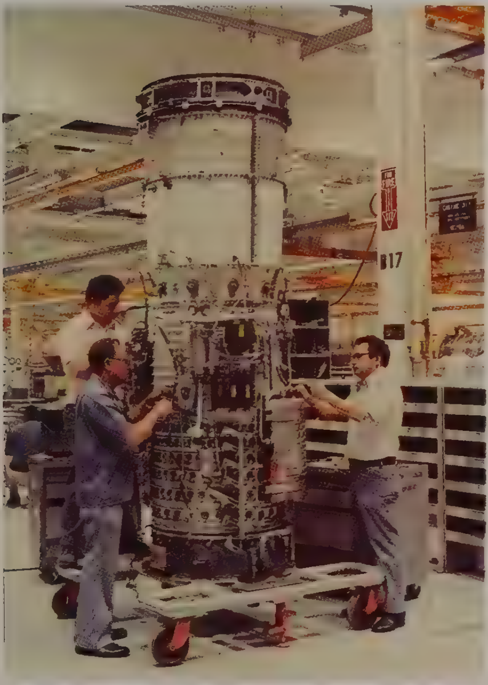


Kelly continues to both manage and overhaul the General Electric TF39 engine of the C-5.

preparation for the new work load test cells west of Military Drive, which were accepted by the Air Force in March 1970, were reconstructed.

Only two TF39 engines came off the overhaul line by mid-1971, but production jumped to ninety-nine during the next year. General Electric was still manufacturing new engines at this point, but the production of new engines ceased in December 1971. Two years later Kelly took on complete management and engineering responsibility for the TF39. Kelly engineers thus played a key role in the development of a series of technological changes which dramatically increased the engine's time between major overhauls. Beginning in 1979, San Antonio converted the TF39 engine fleet to the most recent configuration, increasing the average flying time between removals for overhaul from 3,000 to 5,000 hours. The result was both a far more reliable and long-lived engine and a rapid decline in the number of TF39 engines returned to Kelly for overhaul. During 1975, San Antonio overhauled seventy TF39 engines, but in 1976 this number dropped to twenty-eight--and management specialists predicted a decline to approximately twelve per year by 1987. A work load this size was about the least the depot could economically justify, and in 1985 Military Airlift Command agreed to supply at least two engines per month. This would allow San Antonio to maintain a repair capability and keep workers' skills current.

When American forces deployed to Saudi Arabia in the fall of 1990 as part of Operation Desert Shield, the C-5 fleet was forced to operate well beyond forecasted limits. Keeping the C-5s in the air involved a major effort on behalf of the TF39 engine, and Kelly's managers performed near miracles in keeping the number of needed engines up. On the other hand, everyone was also aware that the steady strain on the engines and the support system would eventually result in a downturn at some point. And, as American military efforts in the Persian Gulf began to wind down at the conclusion of Operation Desert Storm in March 1991, Kelly's engine specialists indeed were confronted by a drop in the availability of spare TF39 engines. Clearly, the engine would remain a major part of Kelly's work load for some time to come.



Overhaul and management of the complex F100 engine has been a Kelly responsibility since the early 1970s.

The F100: Testing the Limits of Engine Design

When SAAMA became the designated manager and specialized repair activity for the new Pratt and Whitney F100 engine, powerplant of the F-15, in October 1969, few could foresee the way this engine would come to dominate the management and engine repair activities at Kelly. The F100 represented a attempt to push jet engine technology as far as possible in a quest for dramatically higher weight-to-thrust ratios, higher speed, and, hopefully, greater ease of maintenance. Among many novel aspects, the F100 was developed from the start as a modular engine. There were five modules, and, theoretically, if one of them posed a problem, it could be replaced without the need to rebuild the entire engine.

Personnel from Kelly were involved in planning for support of the F100 from the start, but the first F100 engine did not arrive at the depot until August 9, 1974. This engine served as a model, allowing maintenance teams to check overhaul procedures and evaluate the adequacy of tools, technical orders, and other data. The first engine actually to complete the overhaul process came off the line in September 1975.

When LOGAIR began operation, contract carriers often flew surplus World War II transports such as this former C-46.

LOGAIR

By the early 1950s, American airpower could leap oceans and continents to deliver tactical or strategic attacks in support of national strategy. But the speed and flexibility of airpower were, as World War II experience showed, limited by a logistics support system that still relied on road, rail or ship transportation. The arrival of the 3rd Transport Squadron at Duncan Field in the mid-1930s marked an early attempt to escape this situation through the use of air transport, but it was not enough. During the Korean War the Air Force began relying to some extent on civilian contract airlift, and by 1954, it was apparent that some sort of contract system for domestic airlift was a necessity.

After studying the issue, Air Materiel Command concluded that the Military Air Transport Service could not operate a dependable domestic air cargo service in peacetime, and that a contract system could be run at half the cost of commercial service. Thus, on April 1, 1954, a contract system known as the Mercury System began ferrying cargo between domestic depots, and from the depots to aerial ports of embarkation for overseas deliveries. The contract carriers owned their own aircraft, flew only within the continental United States, and the cargo they carried was primarily urgently needed items. By August 1954, this contract system was known as LOGAIR, or Logistics Airlift.

Over the next thirty-five years, the LOGAIR system more than showed its worth. By 1957, LOGAIR flights moved over 3,000 tons of cargo along a complex series of routes. Flights went into eleven locations in 1954, and twenty-five locations just four years later. By the mid-1980s, Kelly alone was handling some 5,400 tons of LOGAIR cargo every month, and the number of carriers had grown from two, flying war-surplus C-46 transports, to five, flying DC-9 jets and L100 four-engine turboprop transports. (The L100 is the civilian version of the C-130 transport.) More than simply saving money and time, LOGAIR proved a profitable and effective way to move priority cargoes rapidly, and by the end of the 1980s was a key part of the Air Force logistics infrastructure.

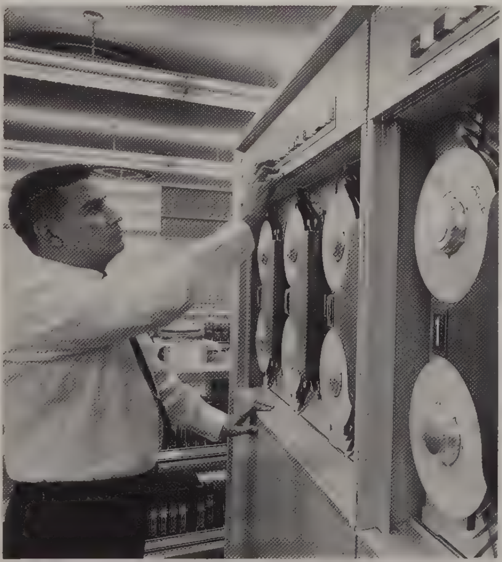
Unfortunately, the F100 engine did not live up to the promise of its technological innovativeness. From the start there were numerous problems, a situation exacerbated by the failure to purchase sufficient spare parts during the first few years. First stage turbine blades, for example, lasted only 700 hours instead of 1,200 hours, and even the emergency purchase of 88,000 blades did not solve the problem. Main fuel pumps failed due to erosion in the sideplates; defective clock oscillators broke down in the electronic engine control of 350 engines; augmentor pumps leaked; and the unified fuel control proved to be a constant source of problems for years.

Bringing the number of spare engines up to required levels proved almost impossible, and the situation was further aggravated by the need to provide support for two separate variants of the engine. The F100-PW-100 powered the F-15, while the F100-PW-200 powered the F-16. Although these engines were essentially similar, the F-16 variant carried a number of different items--including a digital electronic engine control--not on the engines that went into F-15s. This was due to the fact that the F-15 had two engines and the F-16 only one. The F-15 thus had built-in redundancy, while the Air Force hoped to decrease the likelihood of an engine failure causing the loss of an F-16 by adding features to the engine. However, since the engines were not interchangeable, the differences meant that San Antonio managers had to provide for what amounted to two different engines.

In the mid-1980s, San Antonio began implementing a scheme to increase the longevity of both F100 variants through the installation of a redesigned core module. Known as the Increased Life Core, this development, largely the result of continuous efforts by both the Air Force and Pratt and Whitney under the Component Improvement Program, promised to nearly double the expected service life of the core--the "firebox" of the engine. In addition, while still trying to cope with an apparently endless series of problems with turbine blades, electronic controls, and the augmentor (or afterburner), San Antonio's F100 managers also pushed forward with planning for a third variant, the F100-PW-220. Planners hoped that this variant, which would include all the longevity developments, including the Increased Life Core, would offer substantial improvements in reliability. In addition, planners expected this third variant to be suitable for either the F-15 or the F-16, eliminating the need to support two separate engines. By 1990, a program was underway to modify all existing F100 engines to the -200 configuration (resulting in an engine known as the F100-PW-220E, the E standing for equivalent). While the complete results of this upgrade remained unknown by 1991, test results from squadrons equipped with -220 engines suggested that, even if the engine did not live up to the most optimistic expectations, it still represented a large forward stride in terms of reliability and supportability.

Changing Concepts of Management

Throughout the 1950s and early 1960s, Air Force logisticians dealt with a technological world which was changing at an increasingly rapid pace. At the same time, the Air Force was committed to the maintenance of both first-line defense and constant readiness. Coping with the changing technology of air weaponry while attempting to maintain a force that was also immediately ready for combat was a totally new experience for any branch of the American military. In the past, changes to weapons had been incremental and evolutionary, but by 1960 the shifts between the end of the Korean War and 1960 had been dramatic. Moreover, despite the belief that the "next" war would be fought with existing equipment (planners did not believe that there would be time to retool American industry for war production, or make substantial changes to existing weapons once



The increasing use of computers aided management of increasingly complex systems.

war began), the pace of technological change prevented stockpiling large quantities of material. The choice was to build-up a large supply of weapons and parts, or steadily develop new weapons to reflect the emergence of new technological advances. The Air Force chose to do both, placing a tremendous strain on its arrangements for procuring and maintaining its systems.

Prior to World War II, a handful of depots serviced specified geographic areas. Since the types of aircraft within any given area might vary, the depots dealt with a wide variety of aircraft and engines. A large proportion of major overhaul work was done by the manufacturer, but the depots still stockpiled a wide array of items. During the war, though, Air Materiel Command introduced the concept of specialized repair, funneling certain aircraft, engines, or components to specific repair centers. The Fairfield Depot handled B-17s, for example, while San Antonio increasingly dealt with B-29 heavy bombers. This did not preclude a depot from repairing other types of aircraft, of course. At one time or another, San Antonio handled nearly every type of aircraft in the inventory. But it did simplify the stockpiling of parts and made the training of new workers somewhat easier.

During the late 1940s, the Air Force continued this approach, dividing the United States into two zones and making a depot in each zone responsible for specified classes of equipment. However, this system was not entirely successful during the Korean War (when Far Eastern Air Forces sometimes had to obtain what it needed through Army supply channels), and in the early 1950s Air Materiel Command set out to revise the entire system of supply, maintenance, and support.

Weapon System Approach

In 1953, Air Materiel Command adopted a logistics strategy which aimed at eliminating the prestocking of overseas depots and reducing the amount of material in the supply pipeline at any given time. In addition, the Air Force began to move away from the traditional management of commodities--i.e., the equipment used in a variety of aircraft--toward the management of all the components of an aircraft as part of a single integrated weapons system. Such a move could not end the management of commodities altogether, but it did allow a single manager to hold responsibility for all spare parts and equipment associated with a particular aircraft. At the headquarters level, the organization set up to accomplish this during development and procurement of a new weapon system was called a joint project office (weapon system project office after 1953).

At the same time, arrangements for the logistical support of operational systems evolved in a similar direction. After testing the idea at Oklahoma City in 1954, Air Materiel Command established weapon system managers at all the AMAs in 1956. Under this arrangement, the AMA selected to manage a particular weapon system became the "lead" AMA for that system, with the AMA commander designated as the logistics support manager. At the end of 1957, AMA also designated specific AMAs as managers for classes of aircraft, with Kelly's depot assigned bombers and transports. In addition, AMAs continued to manage commodity classes. In 1958, AMC went another step farther by directing each AMA to form a Directorate of Logistics Support as a central point for all management concerns, both systems and commodities.

Organizational Changes at SAAMA

These changes were reflected in a series of organizational changes at SAAMA during the same years. During the mid-1950s, representatives from the SAAMA Directorates of Supply, Procurement, and Maintenance, and the Plans and Programming Office met regularly as part of Weapon System Phasing Groups. One of these groups existed for each weapon system assigned to San Antonio, and these groups met at regular intervals with their counterparts at AMC headquarters. There, representatives from the using commands and the principal contractors joined them in making decisions in regard to solving support issues. In March 1955, SAAMA set up the Delta Cover Program to provide a single source of support for the F-102. This arrangement was not, as it turned out, entirely satisfactory to all the agencies involved, but it did serve as an important step in the process of reforming logistics support.

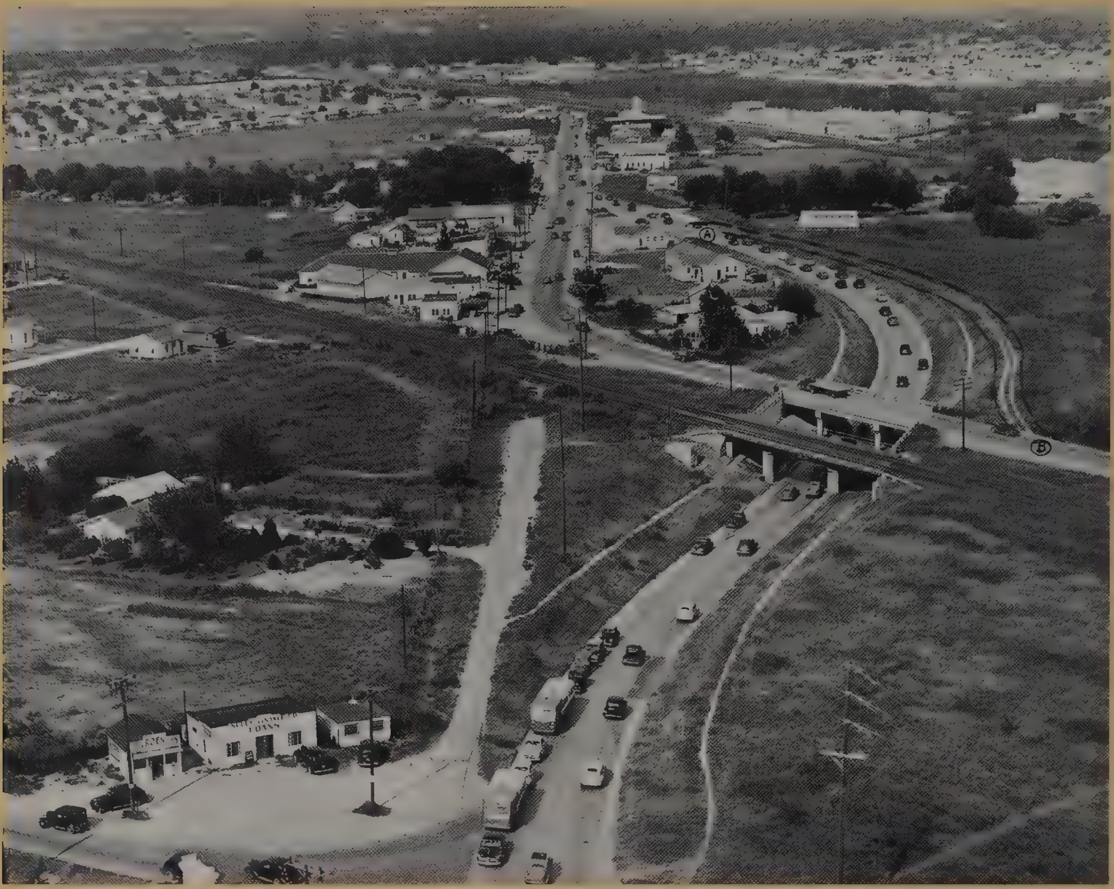
During 1957, Major General Thetus C. Odom, SAAMA commander, assigned Colonel Roger L. Kettleston as Assistant to the Commander, and designated him as Deputy Director of Supply, Deputy Director of Procurement, and Deputy Direc-

The need to effectively manage systems such as the B-58 "Hustler" spurred the formation of the Directorate of Logistics Support Management in 1959.

tor of Maintenance for the F-102. Again going outside the existing organizational framework, this step centralized control over F-102 support. It was followed by realignments within the Directorate of Supply and Services centralizing management of both F-102 and F-106 systems.

In early 1958, SAAMA created the B-58 Logistic Support Management Office to coordinate support efforts for the B-58 and separate these activities organizationally from internal depot operations. First established in May, this new office did not actually begin carrying out its tasks until the end of June. Housed at first in building 171, it was soon relocated to East Kelly where it took over the former offices of the Continental Division of the Military Air Transport Service in building 3030.

The next step was the creation of a distinct management directorate, a step actively encouraged by General Odom and directed by AMC in the fall. As outlined by AMC, the new organizaton would be implemented gradually in a two-phased process which, in addition to creating a centralized management directorate, would combine supply and maintenance operations in a Directorate of Industrial Operations. General Odom, however, obtained permission to follow a slightly different tack at SAAMA, and the depot organization which emerged in January 1959 at San Antonio kept supply and maintenance separate. Within the new Directorate of Logistics Support Management, different divisions held responsibility for each major weapon system (B-58, F-102/106, and B-70). All other assigned aircraft went into a Miscellaneous Aircraft and Commodities Division, while engines were handled by another separate division, and a final division dealt with engineering and support issues. Although the creation of this new organization did not solve all problems immediately (there were numerous adjustments that had to be made throughout the depot, and making them took time), it did establish a permanent, centralized organization to manage weapon systems on a worldwide basis and marked the culmination of a decade of experimentation in management. The Directorate of Logistics Support Management was renamed the Directorate of Materiel Management in February 1960 and, despite several internal restructurings, remained a cornerstone of depot organization through the end of the 1980s.

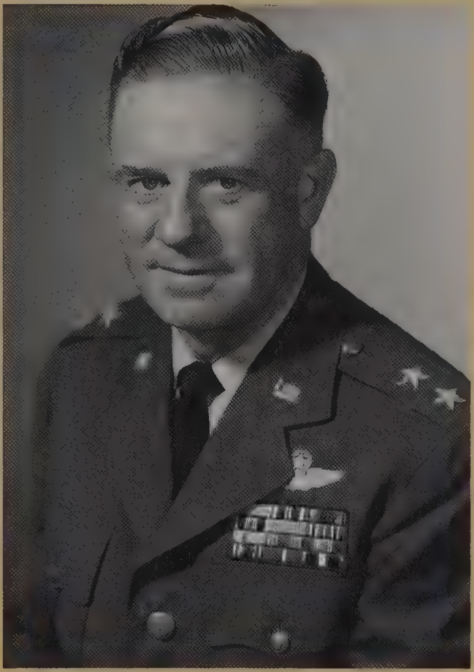


Before General Hudnell Drive existed, Kelly workers traveled to and from the base via the Frio City Road.

General Hudnell Drive

The enormous expansion of the depot work force at Kelly from World War II to 1960 led to daily traffic jams along the roads leading to the base. Construction of General McMullen Drive in 1950 was only a partial solution to the problem. However, efforts to convince San Antonio voters to approve a bond issue to pay for the building of another access road seemed doomed when the issue was defeated in June 1960. Rather than simply accepting this result, Major General William T. Hudnell, the new San Antonio Air Materiel Commander, energetically set out to reverse it. In October, the San Antonio City Council expressed its reluctance to resubmit the question to the voters, unless it was clear there was a overwhelming public support for such a step. Led by General Hudnell, a massive public relations campaign was soon underway to generate exactly the kind of focal support the council wanted to see--a campaign that was crowned with success when voters approved a new expressway by a four-to-one margin in January 1961.

Construction got underway in the fall of 1964, and the completed access road was opened in January 1967. The City Council, recognizing the key role played by General Hudnell, officially named the road in his honor in February 1965. In September 1989, a plaque memorializing General Hudnell and his role in the creation of the access road was unveiled in a formal ceremony. In his speech, San Antonio Air Logistics Commander, Major General Richard D. Smith, pointed out that General Hudnell Drive was "more than just a road," it was a constant reminder of the close ties that have bound San Antonio and Kelly Air Force Base in partnership for more than three generations.



Major General William T. Hudnell

Major General William T. Hudnell commanded the San Antonio Air Materiel Area from August 30, 1960 through June 1, 1965. A specialist in air logistics with a wealth of first-hand experience in modernizing military logistics techniques, he was also a fighter pilot and an Air Force planner.

He enlisted in the Air Corps in January 1931, earning his wings and commission at Kelly Field's Advanced Flying School during the summer of 1933.

During more than thirty-four years of military service he was assigned in many parts of the world, and particularly in the Pacific area where he served as Chief of Logistics in the Far East Air Forces during World War II and later commanded the Air Materiel Forces, Pacific. In addition, he held staff positions at Headquarters Air Force Logistics Command.

General Hudnell was rated a Command Pilot. During World War II, he flew thirty-five combat missions in the Southwest Pacific Theater and was credited with the kill of a "GEORGE" fighter plane for which he won the Air Medal. He received the Distinguished Flying Cross for successfully landing a plane with jammed controls.

General Hudnell also held the distinction of serving as the Wing Commander of the very first combat-ready jet fighter wing in the Air Force.

Crises of Early 1960s

Two major foreign relations crises erupted in the early 1960s, both of which demanded heightened activity at the San Antonio Air Materiel Area. The first was the Berlin Crisis of 1961. In June, President John F. Kennedy met Soviet Premier Nikita Khruschev in a summit conference in Vienna, Austria. In the aftermath of this conference, sensing an opportunity to bully the younger American president, Khruschev threatened to tear up the Four Power Agreement governing Allied occupation of Berlin. Kennedy responded with a dramatic show of force, beefing up United States military forces in the western sector of the city, calling up 75,000 reservists a month later, and visiting Berlin in an emotional gesture that captured world attention.

The call-up of sixty-four Air National Guard units and seven Air Force Reserve units--25,000 guardsmen and 3,000 reservists--was authorized on 1 August 1961. By the time most of these units reached active duty, Soviet closure of the border between East and West Germany had further heightened tensions.

In support of American forces already in Europe, and to assist in this mobilization, SAAMA rapidly increased the movement of supplies from the depot to units overseas. The airlift also increased pressure on Kelly's maintenance shops, which had to increase the rate of production for engines such as the R4360 and T56.

Just over a year later, a Soviet attempt to place intermediate range missiles in Cuba resulted in the Cuban Missile Crisis of October 1962. The announcement that the Soviet Union had established ballistic missile sites in Cuba, followed by the imposition of an American naval quarantine of the island, brought the world close to World War III.

Ultimately, Soviet vessels carrying missiles to Cuba turned around and tensions eased. But for a few weeks, the United States was at the brink. Most citizens could only hold their breath, but workers at Kelly were called upon to dramatically increase the output of B-52s in depot overhaul. The overtime costs were twice those anticipated for the year, but the job, which for many San Antonio Air Materiel Area offices involved twenty-four hour activity seven days a week, was done.

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Management of Air Force watercraft, such as this missile retrieval boat, became a Kelly responsibility in 1965.

Depot Consolidation in the 1960s

During the mid-1960s, the Air Force reduced its aircraft inventory through the retirement of older weapon systems in favor of newer aircraft and missile systems. At the same time, at the direction of Secretary of Defense Robert S. McNamara, Air Force Logistics Command (AFLC) sought to improve the efficiency and cost-effectiveness of its operations through the consolidation of its depots. Between December 1963 and November 1964, Secretary McNamara announced the phase out of four of the existing nine depots: Rome, Middletown, Mobile, and San Bernadino would close. Their work loads were picked up by the remaining five depots.

For San Antonio this meant the gaining of a number of new responsibilities. From Middletown, San Antonio took on management of five aircraft systems: the F-5, the T-38, the T-37, the U-3, and the P2V5. San Antonio also became the item manager for the federal supply classes covering parachutes, aerial pick-up equipment, specialized flight clothing, and precision measuring equipment calibration items. In addition, the Directorate of Aerospace Fuels relocated from Middletown to San Antonio, bringing with it an additional 1,783 personnel authorizations.

From Mobile, item management for thirty-five supply classes came to Kelly, along with responsibility for the Department of Defense sentry dog program (August 2, 1965), the Air Force watercraft program (November 1, 1965), and non-aircraft engines (August 16, 1965). In all, the transfer of these areas of responsibility to SAAMA brought a further 2,330 personnel authorizations. But, of the over 4,500 new authorizations at SAAMA, only 1,406 were filled by people transferring to San Antonio from the eliminated depots. The remaining slots were filled by people hired locally, giving the San Antonio city economy a large boost. Of course, finding the necessary office space to accommodate so many new people was a problem. Building 43 was converted into office space, three buildings (1622, 1623, and 1624) were rebuilt into a single structure to house the Comptroller, and another 191 square-feet of space in building 171 was converted from warehouse to office space.

Facing Page: C-119 "Boxcars" of Kelly's 433rd Troop Carrier Wing line the ramp during the Cuban Missile Crisis of 1962.

Aerial Port of Embarkation

On July 1, 1965, Kelly began operating an Aerial Port of Embarkation, establishing direct cargo service between SAAMA and the Far East Service went through five existing Military Airlift Command routes from Kelly to Tachikawa Air Base, Japan; Kadena Air Base, Okinawa; Kimpo Air Base, Korea; Clark Air Base, Philippines; and Saigon, South Vietnam. Five further channels were added in 1967, three to bases in Thailand (Bangkok, Don Muang Airport, and Udorn Airfield) and two to bases in South Vietnam (Da Nang and Cam Ranh Bay.) Later, the channels to Thailand and Korea were shifted to the aerial port at Oklahoma City, with Kelly adding Phu Cat Air Base in South Vietnam.

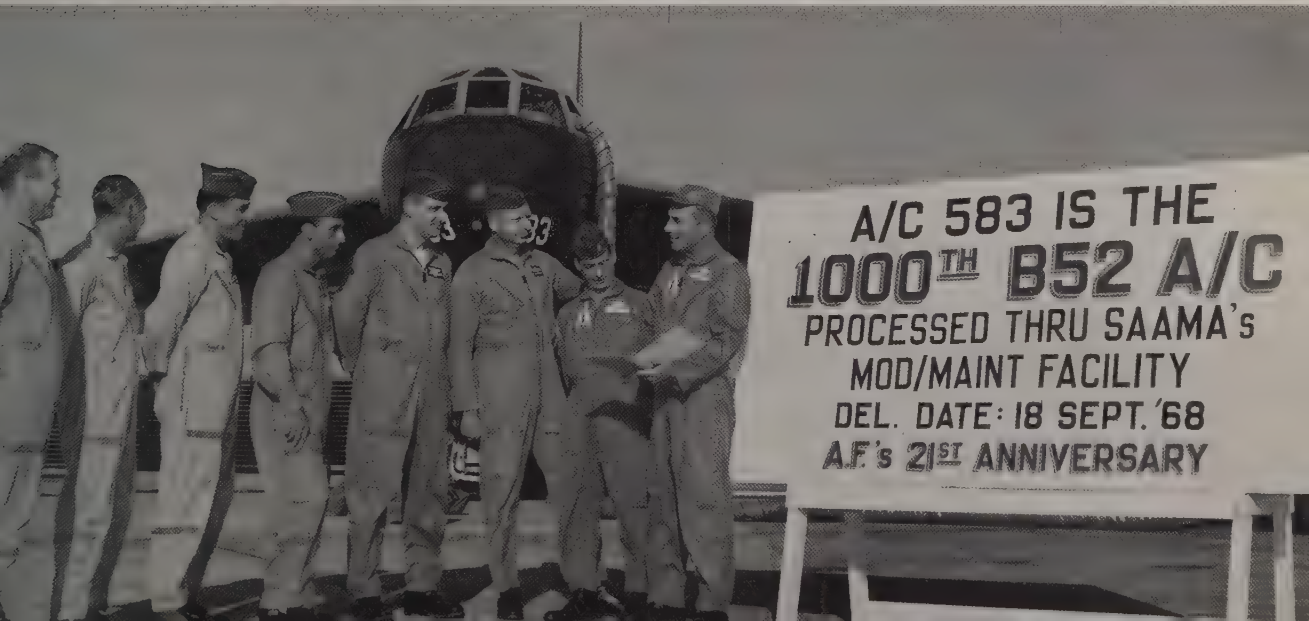
A combination of old facilities and inexperience created problems at first, but in 1967 the facilities were updated through replacement of the old warehouse conveyor system with a new high-line system and expansion of outside storage. Additional trailer-mounted conveyors, added unloading ramps, and newer punch-card accounting devices also helped speed the loading and unloading of cargo, allowing pallets to go directly from truck to aircraft. A further plus was the increasing use of the C-141 Starlifter. Able to carry over 67,000 pounds of cargo, these large jets steadily replaced the older, piston-engined C-124s during 1967. By 1968, C-141s accounted for sixty percent of the outbound flights from Kelly's aerial port. By this time, too, delays were almost non-existent. Of 2,700 flights, carrying some 55,000 tons of cargo in and out of the port in 1968, only five experienced any delay.

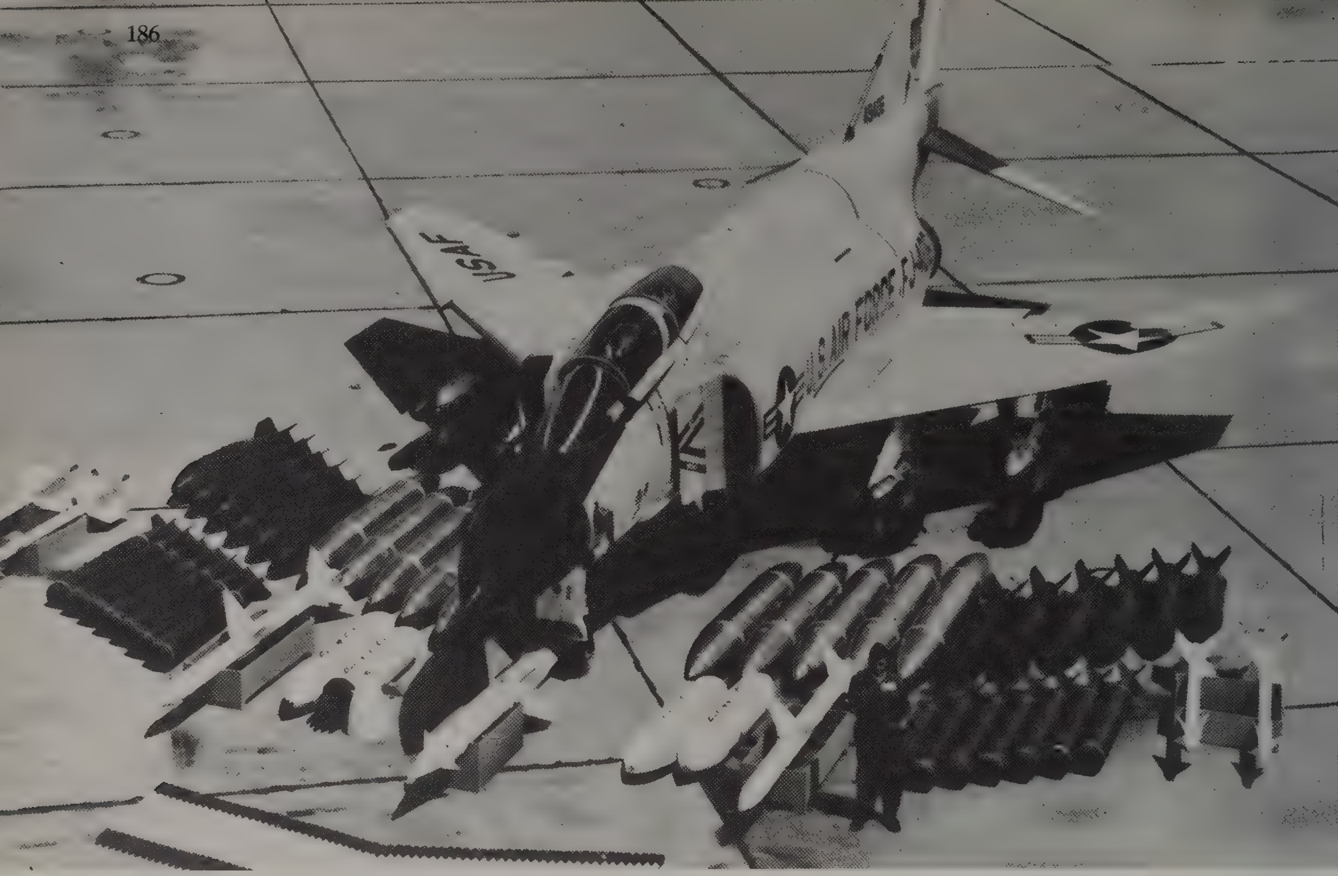
Only about twenty percent of the outbound cargo was generated at Kelly. The remainder came by truck and rail from throughout the region between the Rocky Mountains and the Mississippi River. Traffic control was vital, as was accurate accounting of items in storage. While incoming cargo was subject to customs inspection and quarantine, aerial port workers were concerned primarily with speed in getting the outbound flights loaded and on their way. During one period in 1968, outbound cargos also included numbers of crickets, then infesting south Texas, and outbound aircraft were delayed when they passed through Japan. Unfortunately, insect control efforts were not entirely successful.

Project LOGGY SORT

In August 1966, AFLC headquarters began a study to evaluate the optimum amount of repair and overhaul work which could be done by field units at overseas bases versus returning items to depots. Although Pacific Air Forces was moving toward a goal of greater self-sufficiency at its overseas bases, AFLC headquarters argued that it made more sense

B-52 modifications were a large work load at Kelly during the Vietnam War.





Project LOGGY SORT evaluated the amount of maintenance that an F-4 unit could accomplish in the field.

to limit maintenance at forward bases to the removal and replacement of items. Repair and overhaul work at the forward bases would be limited to only those items which could be repaired quickly or those in high demand. Striking the proper balance between the repair work done at the base or at depot, required an analysis of the time and costs involved.

The project was codenamed LOGGY SORT, with "LOGGY" being the designater for an AFLC project and "SORT" standing for Specialized Overseas Repair Test. When the designator for AFLC projects changed from LOGGY to PACER in August 1967, the project was renamed PACER SORT. Getting the project underway required the creation of a task force at AFLC headquarters, along with a team to evaluate repair efforts overseas, another team at the Ogden Air Materiel Area (depot for the F-4 aircraft) to evaluate depot effectiveness, and project offices at each of the other AMAs. The F-4C was chosen as the aircraft system to investigate, and Cam Ranh Bay was chosen as the base in Vietnam where field repair efforts could be evaluated.

The SAAMA project office came into being in October 1966. At first it consisted of only six people, but another twenty personnel slots were added during the year. By June 1967, the SAAMA group had guided the creation of item-records for approximately 325,000 pieces of aerospace ground equipment related to the F-4C and analyzed ninety-two items managed by SAAMA to establish base level repair restrictions. Data collection ended in October 1967, and SAAMA personnel assisted the evaluation team at Ogden in analyzing and verifying the results. To a large extent, these results appeared to confirm AFLC's arguments that the complexity and sophistication of modern aircraft and weapon systems made it exceedingly difficult and expensive to establish complete overhaul facilities at forward locations. But, at the same time, it was clear that forward units had to be equipped to handle at least some portion of their repair and overhaul needs if they were to retain their flexibility and ability to carry out their missions.

Support During the Later Phases of the War

Among San Antonio managed aircraft, the F-102, the O-2, the A-37, and the F-5 all played roles in the aerial campaigns in and around Vietnam. Used almost entirely in an air defense role, the F-102 was soon superseded by the F-4. Forward observers and air controllers used the O-2 to spot ground targets and direct the strikes of ground support aircraft. The A-37, introduced into the inventory in 1967, was designed for close air support in counterinsurgency operations, and the F-5 was supplied to allied countries under the Foreign Military Sales (FMS) Program. As the war continued, SAAMA efforts were increasingly aimed at supporting these two aircraft.

A-37 Support

The first A-37s were converted T-37 trainers, removed from storage, converted to an attack configuration, and designated A-37As. They began operating in South Vietnam during 1967. New aircraft, built from the start for the attack role, were designated A-37B and began reaching Vietnam in September 1968. Under FMS, SAAMA assisted in equipping three A-37 squadrons of the South Vietnamese Air Force through the creation of support packages of spare parts and aerospace ground equipment for each of the squadrons. In addition, SAAMA maintenance personnel performed system and armament checks on sixteen A-37s, which arrived in Vietnam during the fall of 1969.

Volunteers from the San Antonio Air Materiel Area were sent to Vietnam to assist with such weapon systems as the A-37.

F-5 Support

Northrop designed the F-5 "Freedom Fighter" from the start as a relatively inexpensive, yet modern and versatile, fighter for export to Allied countries. Production began in 1962, and during 1964 the Air Force evaluated the F-5 under combat conditions in Vietnam in a project called "Skoshi Tiger." The aircraft in the test were modified FMS aircraft, flown by American pilots. After completion of the test, F-5s began entering the inventories of several Allied air forces in the Pacific region. The 3rd Tactical Fighter Wing continued to fly its own F-5s out of Bien Hoa Air Base for another year. But in April 1967, the wing was deactivated and its aircraft and equipment were transferred over to the South Vietnamese.

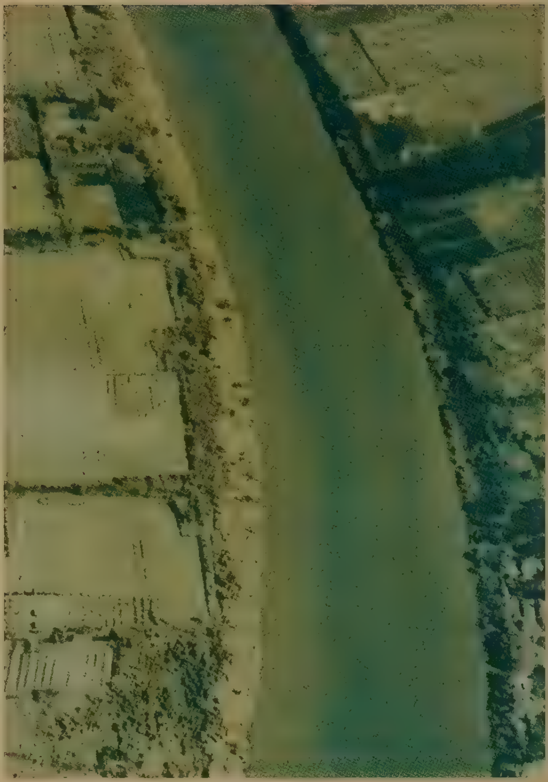
Although the F-5 was successful in its role as a fighter-bomber, a number of problems appeared during active service. It could not operate in heavy rain, for example, and the air conditioning system sometimes caused condensation inside the canopy. Other problems involved failures of the explosive bolts used to jetison pylons and damage to the engines from debris thrown up by the aircraft's own bombs. To help alleviate these problems, SAAMA developed three modifications and, when efforts to install them through contract failed, sent a three man team from Kelly to Vietnam in April 1967. Within a month, the team completed the modifications, and left Vietnam on May 20.

Herbicide Management and Storage

One of the most controversial steps taken by American strategists during the Vietnam War was the 1961 decision to employ chemical defoliants. Most of the controversy surrounding the use of herbicides has emerged since the war ended. At the time, there was little information about possible long-term side effects, and the use of herbicides seemed to offer a reasonable way of denying the enemy hiding places and food supplies.

Throughout the war, herbicides were managed by the Directorate of Aerospace Fuels, the Air Force organization with the greatest experience in the safe handling of hazardous chemicals. Although aerial spraying of defoliants began in 1961, the period of greatest use was 1966 through 1970, with a peak in 1968. The most effective, and ultimately the most controversial, herbicide was Agent Orange, but other chemical defoliants were used as well. Indeed, by 1968 it was clear that more defoliant had been procured than would be used, creating both storage and disposal problems.

A number of alternatives for disposal of excess herbicides were explored as the decline in their use in Southeast Asia built up stockpiles. Possible uses for some of the herbicides included scrub brush control on bombing ranges and aquatic weed control in African rivers. None were adopted. Instead, starting in March 1977, some 2.2 million gallons of Agent Orange were carefully loaded aboard a Dutch incinerator ship, and burned out at sea. The job was finished in early September, and the vessel cleaned. However, despite American tests (verified by a Swiss laboratory) that showed the vessel was uncontaminated, Dutch authorities refused to let it enter a Dutch port. Ultimately, its owners presented a claim to the Government for $2,000,000 to cover losses while the ship was out of service.



Aerial spraying of herbicides in Vietnam not only took away "Charlie's" cover, it destroyed his rice crop as well. Enemy territory on the left was sprayed, while friendly fields on the right bank of the river were spared.

Fifty-five gallon drums of Herbicide Orange wait to be loaded aboard the Dutch incinerator ship "Vulcanus," where the herbicide would be mixed with diesel fuel and burned far out to sea.

SAAMA Support for the Electronic Ground War

In mid-1966, Secretary of Defense Robert McNamara brought together a number of scientists and engineers to examine the on-going air campaign and suggest ways to make it more effective. Among the recommendations of this group--informally known as the "Jason Group", after the division of the Institute of Defense Analyses which organized the meeting--was the construction of an electronic zone in which sensors could detect the presence and location of enemy troops, giving aircraft accurate coordinates for an attack. McNamara enthusiastically supported the idea, but it soon became clear that the cost of creating such an area covering the entire demilitarized zone between North and South Vietnam would be prohibitive and would involve several hundred ground troops as well. Instead, a program called IGLOO WHITE emerged, in which sensors were deployed along the so-called Ho Chi Minh Trail--a network of roads and trails leading from North Vietnam through Laos and Cambodia to South Vietnam. There were a wide variety of sensors, from vibration detectors to infrared devices, which sent data to aircraft circling overhead. These aircraft relayed these signals to the Infiltration Surveillance Center at Nakhon Phanom, Thailand, where, with the aid of computers, they were plotted on monitors. Technicians could then direct aircraft to the specific coordinates shown, theoretically increasing the chance for an effective strike on a convoy.

The IGLOO WHITE program began during late 1967, but SAAMA was not involved until 1970 when Kelly personnel developed the plan which established the procedures for Air Force procurement, storage, palletization, distribution, and testing of Phase III sensor modules. During 1971, SAAMA took over management responsibility from the Defense Communications Planning Group for several ground sensors: three seismic detectors, a commandable microphone, and an engine emission detector. At the same time, SAAMA began handling the storage and shipment of sensors, with the first assets arriving at Kelly in July. In 1973, IGLOO WHITE was discontinued and replaced by a follow-on program called Dart Sensor. Sensor activities in Southeast Asia were stopped, and SAAMA personnel managed the return of sensors to storage in the United States.

A subsidiary program called PAVE EAGLE also involved SAAMA personnel. The purpose of this program was to develop unmanned, reconnaissance drones which could carry cameras and sensors or

Robert D. Fuentes, left, of the Aerospace Ground Equipment Item Management Division, demonstrates sensor flaps that prevent penetration above the antenna to SSgt. Joe Eldridge, an instructor at the Camp Bullis Combat Preparedness Training Course.

A Commike III sensor, typical of those dropped along the Ho Chi Minh Trail as part of IGLOO WHITE.

serve as airborne relays for data picked up by sensors on the ground. Although the Aeronautical Systems Division of Air Force Systems Command managed the program, SAAMA was called upon to help overcome difficulties with the engine. However, in 1973, concurrent with the end of direct American involvement in Vietnam, the program was terminated.

Vietnamization

The term "Vietnamization," first enunciated publically by the administration of President Richard M. Nixon in 1969, was based on conclusions reached by a wide range of military and civilian leaders in the aftermath of the North Vietnamese Tet Offensive in 1968. In essence, Vietnamization called for the South Vietnamese to bear the burden of the fighting while American efforts went toward supplying them with arms and equipment. For SAAMA, this new policy meant increased effort toward building up South Vietnamese maintenance and supply facilities, as well as continuing efforts to deliver aircraft and spare parts.

Bien Hoa

In November 1970, SAAMA sent an industrial engineer to assist an Air Force Advisory Team in evaluating a proposed engine overhaul facility at Bien Hoa Air Base. By February 1971, AFLC headquarters had given SAAMA the complete responsibility for developing plans to reconstruct an existing building at Bien Hoa, turning it into an engine overhaul shop. As a team of engineers, technicians, and engine specialists went to work on this project, they were also handed the task of developing the utility design for the Navy office actually doing the construction work.

The new facility was finished in June 1971, and SAAMA then supplied all the equipment along with a full engineering and planning package for the overhaul of J85, T53, and T55 engines. Despite delays caused by a rocket attack, the facility was in full operation by mid 1972. In September, after another rocket attack, the Sacramento Air Materiel Area asked for civilian volunteers to help reconstruct the plumbing and electrical systems. Ten SAAMA workers volunteered, followed by fourteen more, who went to Bien Hoa to help set up scheduling, work measurement, and management systems at the facility. Less than a month later, another San Antonio group went to the site to help establish the processes for J85 and T53 engine repair. The facility successfully tested a T53 engine in November and a J85 engine in December, enabling full scale overhaul to get underway a month ahead of schedule. The men from San Antonio turned over the task of training the South Vietnamese to contract instructor personnel hired by Lycoming, Inc. and came home.

CIVILIAN SERVICE
IN
COMBAT AREA

In 1966, the Air Force authorized this sterling silver lapel pin to recognize civilians who served voluntarily for thirty or more days in Vietnam after January 1, 1965.

Sacramento was calling for additional volunteers even as the first groups were preparing to return to the United States. Ultimately, nineteen more SAAMA people volunteered, but in December 1972 AFLC headquarters announced that henceforth civilian specialists needed to support the shops at Bien Hoa would be supplied by contractors; SAAMA's role would be advisory only.

Project ENHANCE PLUS

In October 1972, Kelly began one of its largest projects in support of Vietnamization. Known as ENHANCE PLUS, this project involved extensive logistic support in the transfer of A-37, F-5, and T-38 aircraft--together with spare engines, parts, and other equipment--from the United States to South Vietnam. The project got underway on October 20, with the first A-37 aircraft arriving on the 28th. Between then and November 4, sixty-six aircraft were disassembled, packed, crated, and shipped aboard C-5 transports to Vietnam. Reports on the progress of the program were sent to AFLC headquarters and the Air Force Chief of Staff every twelve hours. The pace was fast; SAAMA workers averaged less than an hour per aircraft, time from when the first A-37 touched down at Kelly until the last one arrived at Phang Rang Air Base was six days, eleven hours, and fifty-one minutes.

At the same time, 256 SAAMA personnel traveled to Vahdati, Iran, to disassemble, pack, and ship thirty-two F-5 aircraft being transferred from the Iranian Air Force to South Vietnam. The team from Kelly, commanded by Colonel Ralph Dresser, left on the 28th and 29th of October aboard a total of eleven C-141s and three C-5s. One hundred and thirty-eight workers traveled with the F-5s, which began leaving Iran on November 20, to unpack and reassemble the aircraft at Bien Hoa.

Workers at Kelly were scarcely finished sending off the first group of A-37 aircraft when twenty-eight T-38s arrived. These, too, were disassembled, packed, and airlifted by mid-November. In addition, San Antonio shipped 414 engines, taking them from major commands and contract overhaul facilities, and provided between seventy-four and 100 percent of all spares and aerospace ground equipment. The cost of this effort, including overtime, supplies, and all equipment, came to $5,700,000.

Orchestrating this complicated set of tasks was an Augmented Command Post set up in the Operations Hangar (Building 1610). Major General William A. Jack, the SAAMA commander, personally directed the operation which continued around-the-clock. On November 13, five days after the last T-38 was on

Kelly teams also accomplished depot level overhaul of CH-47B helicopters at Bien Hoa.

During ENHANCE PLUS, Kelly personnel set records in shipping A-37, T-38, and F-5 aircraft to Vietnam.

its way to Vietnam, the command post manning was reduced to controllers only (although it continued to operate twenty-four hours-a-day), and it finally shut down on November 18. Kelly set several records while carrying out ENHANCE PLUS. Including all the crated aircraft, the Aerial Port sent out 18.1 million pounds of cargo. At one point, the port crews loaded a C-5 in just twenty-two minutes. Headquarters USAF was impressed enough to acknowledge publically the professionalism, dedication, and ingenuity of the SAAMA work force in rising to the challenge, making ENHANCE PLUS one of the brighter moments in Kelly's long heritage of service.

Operation Homecoming

The final chapter of Kelly's support for the American effort in Southeast Asia was the role played by the base in the welcome home for the American prisoners of war (POWs). Lackland was one of ten Air Force bases selected to receive the newly released POWs, all of whom had first been

Colonel Thomas J. Sterling of Fort Walton Beach, Florida, addresses the well-wishers at Kelly upon his return. He was captured on April 18, 1967.

given a medical check-up, new uniforms, and a complete debriefing, along with a brief recuperative stay at the Joint Homecoming Reception Center at Clark Air Base in the Philippines. Fort Sam Houston was selected to serve as one of the Army reception centers because it was the home of the Brooke Army Medical Center. Since neither Lackland or Fort Sam Houston had a runway, Kelly became the initial reception site and the focus of most public attention.

Colonel Joseph H. Wehrle, Director of Plans and Programs at SAAMA, served as the first head of Kelly's reception team. Colonel William MacLachlan, Deputy Base Commander, succeeded him in this role in November 1972.

Kelly's Homecoming Plan was implemented on February 12, 1973. Families of the returning servicemen had been notified earlier, and each had a Personal Assistance Officer assigned to make sure that no questions went unanswered or need unfulfilled. To ensure that the ceremony would be as private and personal as possible, the public was excluded, but Kelly workers and their families were invited to the flight line for weekend arrivals. The first Homecoming flight arrived on February 15, 1973. Ten more flights followed, bringing home twenty Air Force and twelve Army servicemen to an emotional welcome.

Flights bringing former POWs to Kelly began arriving on February 12, 1973. Crowds of sightseers were kept to a minimum, but the excited family members made each arrival a festive occasion.

WELCOME HOME

CHAPTER SEVEN

Shifting Priorities

Even though fighting in Southeast Asia continued during the first few years of the decade, by 1970 the focus of military priorities was already shifting. During the ensuing decade, the United States Air Force -- indeed, the entire Department of Defense -- found itself "doing more with less." Not since 1945 had the military seen its budget and personnel strength slashed so quickly. As the Assistant Vice Chief of Staff of the Air Force said in September 1970, the Air Force was faced with the "unenviable task of minimizing the impact of what could be the most drastic personnel upheaval since the end of World War II."

After over eight years of fighting in Vietnam, the mood of the American people was decidedly anti-military. Rampant inflation, economic stagnation, and the absence of a clear military threat convinced national leaders that the defense budget could be cut drastically to pay for expanded social programs. This all combined to make the defense budget in the "me generation" decade one of the leanest in thirty years. As funding dropped, inflation doubled the price of everything. Costs for manpower, material, and energy skyrocketed. One of the biggest challenges facing Air Force Logistics Command (AFLC) was maintaining an acceptable level of logistical support as defense planners cut supply and maintenance funding to funnel more of the scarce resources into weapon system acquisition. With support cut to the bone, the Air Force of the 1970s came close to becoming a "hollow" force.

Retrenchment and Compression

The Air Force tried a variety of things to match its resources with its mission. One was the reduction of the number of bases worldwide. Unlike the rest of the Air Force, AFLC was spared the wrenching trauma of closing facilities in the 1970s; it already had gone through that in the mid-1960s, when it went from nine to five Air Materiel Areas (AMAs). Another simple way to reduce costs was to cut manpower, and the entire Air Force suffered from arbitrary personnel reductions. As part of this retrenchment, the Air Staff looked at programs to eliminate for manpower and monetary savings. One of these reviews was Project 703, Force Structure Program Analysis, which included the phase-out of the B-58 "Hustler," acceleration of F-102 reclamation, inactivation of the 19th Military Airlift Squadron, and a ten percent decrease in leased communications service. All of these initiatives reduced San Antonio Air Materiel Area's (SAAMA) personnel strength. Another review evolved from Defense Department and congressional interest in the costs associated with operating intermediate headquarters. To absorb the resulting Air Force-wide manpower cuts at the numbered air force-level, organizations were either eliminated or transferred. At Kelly, effective July 1, 1972, the Comptroller, Personnel and Office of Information functions transferred out of the air materiel area and into the air base group.

As operations in the post-Vietnam era scaled down, personnel costs moved up and funding plummeted. San Antonio AMA's budget paid for fewer and fewer people. The previous four-year, upward trend in manpower authorizations came to a crashing halt in fiscal year 1970. Between 1970 and 1976, SAAMA lost over 8,000 positions as its total authorized strength reached its lowest level since 1950. Kelly officials dealt with this personnel turbulence the best they could. To ensure SAAMA met these fiscally driven manpower ceilings, they curtailed hiring, restricted filling vacancies, terminated temporary employees, and encouraged retirements. Congress helped by providing various retirement incentives, including substantial cost of living increases and liberal changes in computing retirement annuities.

Optional retirement benefits were made more attractive, too, as a variety of new programs were set up to entice eligible workers to retire. These ranged from a "discontinued service" retirement (when employees were involuntarily separated from their jobs for reasons not related to misconduct or delinquency) to "trial retirements." In February 1970, AFLC announced employees eligible for optional retirements could try retired life; if they were not happy, they would be rehired within the first year. This program, however, did not live up to AFLC's expectations. Only six SAAMA employees took advantage of trial retirements before Headquarters AFLC discontinued the program in July 1974. On

Civilian Personnel Figures

	Civilian Authorized	Total Authorized
June 1965	18,081	19,068
June 1966	20,992	21,960
June 1967	23,678	24,672
June 1968	24,292	25,806
June 1969	24,595	26,202
June 1970	23,816	25,291
June 1971	21,810	23,029
June 1972	21,238	22,340
June 1973	24,040	21,178
June 1974	19,185	20,355
June 1975	17,767	18,678
Dec 1976	15,664	16,539

Retirement Statistics

	Mandatory Retirement/	Optional Retirement /	Disability	Disc Srvc /	Trial /	Early Out	Total
FY70	12	390	156	180	2	--	740
FY71	22	375	171	194	1	--	63
FY72	15	455	173	234	2	--	879
FY73	16	570	169	52	1	212	1,020
FY74	10	431	190	25	0	144	800
FY75	17	349	333	31	---	300	1,029
J-D 75	11	117	158	21	---	0	407
CY76	18	280	457	283	---	0	1,038
Total	121	2,966	1,807	1,020	6	656	6,676

Part of the Kelly work force leaves for home.

June 12, 1973, the President signed an "early out" retirement plan into public law, which permitted early optional retirement for employees of agencies undergoing a major reduction-in-force (RIF). This proved more popular; during the new program's first year, 212 SAAMA employees took an "early out" and retired.

As the federal budget continued its decline, officials sought other ways to cut payroll costs. On August 5, 1971, the Office of Budget Management established a government-wide initiative to lower the average federal grade by two tenths of a percent. To meet SAAMA's goal, a committee put together a grade roll-back plan, which looked at organizations, position structure, and span of control with an eye toward eliminating supervisor layering, filling positions at the lowest possible level, and consolidating organizations. In 1971, SAAMA's baseline grade average was 7.6744. By the end of June 1974, SAAMA's average GS, or General Schedule, level was 7.4347 (.0397 lower than its goal of 7.4744).

Although SAAMA had been forced to cut over 6,000 authorizations between fiscal year 1970 and fiscal year 1975, it actually had separated only thirty-seven people, and all but two of them had been placed in federal jobs in the San Antonio area. But the reductions that came in 1976 were different; this cut prompted Kelly's first major RIF in over ten years. The Civilian Personnel Office processed over 3,000 personnel actions, which lead to 792 people being placed in lower grade positions and 733 actual separations. After this, the massive cuts stopped, and authorizations remained relatively stable for the rest of the decade.

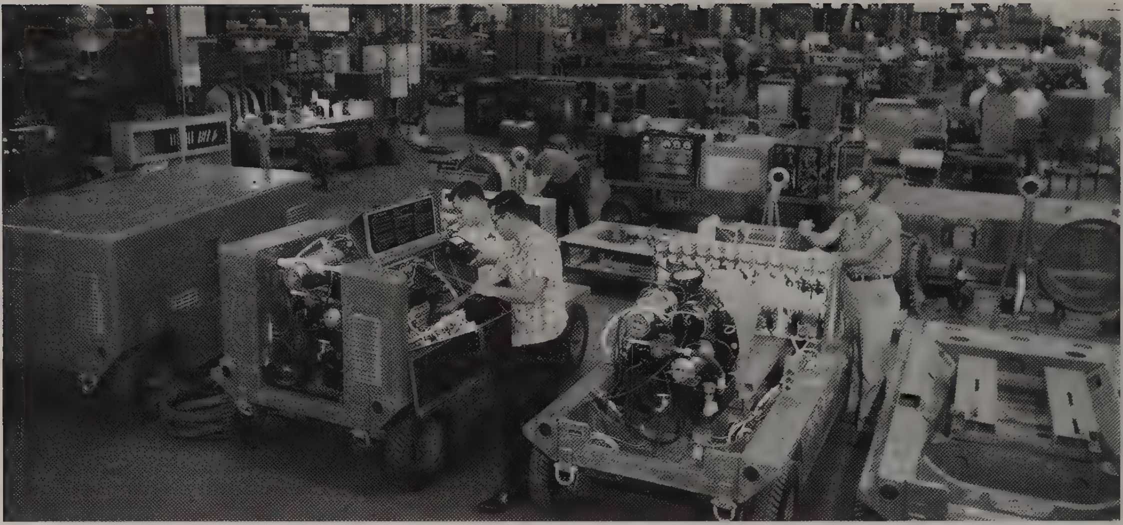
Streamlining the Structure

Technology Repair Centers

On April 17, 1973, the Office of the Secretary of the Air Force announced closure or work load realignments at fourteen Air Force bases because of the draw down of American operations in Southeast Asia. Reductions in the Air Force aircraft inventory and diminished depot level maintenance requirements also contributed to the draw down. At the end of World War II and the Korean War, AFLC's predecessor closed facilities to save money. Air Force Logistics Command did not have that luxury at the end of hostilities in Vietnam. The command already was down to five AMAs, the minimum number deemed necessary to maintain optimum mobilization capability. Consequently, command leaders had to find other ways to reduce expenditures.

As part of this search, AFLC leaders devised the Technology Repair Center (TRC) concept, an innovative approach to maintenance management. Goals of the TRC concept included improving Maintenance's organizational structure, reducing overhead management, increasing the use of industrial facilities, balancing work loads, and simplifying work load assignments. The impetus came from a 1971 Department of Defense directive which required that no more than seventy percent of the maintenance essential to the Air Force mission should be done by military depots. Furthermore, the directive stated that depots should operate at least at eighty-five percent capacity.

The TRC concept called for each depot to maintain items with similar technical characteristics, requiring like skills, facilities, tools, and test equipment. Some 300 types of items were grouped into eighteen



Under the Technology Repair Center concept, SA-ALC had responsibility for maintenance of a number of items, including aerospace ground equipment.

technologies (munitions, avionics, missiles, landing gear, etc.). These included support items known as "exchangeables" but excluded, at least initially, aircraft and engine components. Specialized repair of these items comprised about one-third of the total projected organic, or in-house, work load. The command added aircraft and engine components to the list of technologies in fiscal year 1974. Establishment of the TRCs involved transfer only of repair responsibility, not management.

PACER TORCH, the project name for TRC implementation, began in January 1974 and continued for two years until the TRC plan was completed at all five centers. When fully implemented, more than 9,300 kinds of items and 6.2 million man-hours of work had been shifted among the air logistics centers (ALCs). (On April 1, 1974, AFLC redesignated the air materiel areas as air logistics centers.) Sacramento and Warner Robins ALCs gained in terms of work load while San Antonio and Oklahoma City ALCs lost. Ogden ALC's work load remained about the same.

San Antonio ALC assumed responsibility for Electrical Aerospace Ground Equipment (AGE), Electrical/Mechanical AGE, and nuclear components. It transferred 1.6 million direct product actual hours of work, picking up only 132 thousand hours in new work load. Kelly lost a total of 981 authorizations (117 in fiscal year 1974, 425 in fiscal year 1975, and 439 in 1976) as a result of the work load transfer. Despite the cost and personnel turbulence involved with implementing PACER TORCH, by 1975 AFLC achieved its goal of streamlining operations and balancing maintenance work loads among its five ALCs.

Remodeling System Manager/Item Manager System Responsibilities

Faced with additional manpower cuts over the next three years, Headquarters AFLC looked to reorganize the existing materiel management structure to support the Air Force mission of the future with a minimum of resources. After a year's review, AFLC officials announced on December 4, 1975, that the ALCs would implement the "system manager/item manager" reorganization, nicknamed PACER FLARE, to reduce the cost of the materiel management function by consolidating, merging, and centralizing.

The reorganization took item management responsibilities out of the system management divisions, allowing the system manager to concentrate on customer support. The item manager assumed full responsibility for supporting all items for both the customer and the system manager. This separation of duties allowed additional consolidation of homogeneous items, enabling AFLC to assign more items of a like type to each manager.

Sorry, Out of Gas!

For over thirty years, the industrial nations of the world had been using fossil fuels as if they came from a bottomless pit. This came to a screeching halt in the early 1970s as gluttonous consumption, panic buying, and a crisis in the Middle East dried up most of the world's stored petroleum reserves.

In November 1972, San Antonio's City Public Service Board (CPSB) began experiencing intermittent curtailments in its shipments of natural gas used to generate the city's electricity. By May 1973, continued shortages forced CPSB to use fuel oil, which was four times as expensive, to generate electricity. On May 22, CPSB officials asked Kelly to reduce its consumption of electricity. The next day, Major General William A. Jack, San Antonio Air Materiel Area Commander, implemented a variety of initiatives to reduce energy consumption--electric light intensity was reduced by half, thermostats raised, night-time recreational events cancelled, etc. In the Maintenance area, mechanics used aircraft power generators only when working on aircraft interiors, and pre- and post-flight checks were rescheduled for daylight hours only. Separately, these actions seemed insignificant, but when put together, Kelly's use of electricity declined two percent despite a 15.3 percent increase in the electrical load. Kelly's energy conservation program, and indeed that of the entire Air Force, shifted from reducing costs to conservation of dwindling natural resources.

These shortages extended to aviation and motor gas, too. In May 1973, Kelly's base service station shortened its hours of operation when the monthly gas supply was cut by fifty-five percent.

Within a year, people authorized to use the base service station could only buy ten gallons of gas at a time. In addition, use of government vehicles was curtailed whenever possible, daily mail deliveries were reduced, and trips moving supplies were consolidated.

But the energy shortage got even worse. On October 6, 1973 Egyptian tanks crossed into the Israeli-occupied Sinai Peninsula, setting off yet another Middle East conflict with the Soviet Union on the side of the Arabs and the United States supporting the Israelis. This time, however, American aid to Israel cost her dearly as the Arabs' immediately stopped the flow of their crude oil to any nation that showed support for the Israeli cause. The world's petroleum headache turned into a migraine. People found themselves in the Organizaton of Petroleum Exporting Countries gas line and paying dearly for the privilege.

President Richard Nixon called for an immediate seven percent decrease in energy usage by all federal activities. The Air Force and Air Force Logistics Command aimed at a ten percent reduction, while the San Antonio Air Materiel Area set its own goal of reducing electrical consumption by thirty percent. Kelly's people continued the initiatives begun earlier and took even more. Teams conducted spot inspections to see if thermostats were set at the proper settings and lights turned off when not in use. The Directorate of Maintenance shut down during the Christmas holidays, December 23 to January 1, saving $76,000.

The fuel shortage caused the Directorate of Aerospace Fuels special problems. Responsible for acquisition of aviation gas for the Air Force, directorate personnel found themselves scrambling to fill the service's requirements for JP-4 jet fuel. By the end of December 1973, they only had offers for sixty-one percent of the forty-five million barrels needed for fiscal year 1974. These shortages continued for several years until the oil reserves slowly built back up. Gradually things calmed down; gas lines faded and people became accustomed to paying higher utility bills. But never again did the industrial nations take energy for granted.

Reorganization of item management responsibilities changed the look of the Directorate of Materiel Management.

Despite reduced manpower and funding, Headquarters AFLC wanted to retain an integrated, five ALC structure with each having four prime missions (depot maintenance, distribution, procurement, and materiel management). Command officials hoped restructuring the ALCs' Directorates of Materiel Management would help them do this. In a further effort to centralize and save scarce resources, AFLC leaders wanted to identify those things that could be done outside the ALC Materiel Management organization. They assigned the ALCs' cataloguing and standardization functions to the Defense Logistics Service Center at Battle Creek, Michigan, and centralized the equipment and allowance functions at Warner Robins ALC, Georgia. Air Force Logistics Command's international logistics program went to the 2763rd Supply Squadron at Wright-Patterson AFB, Ohio. San Antonio ALC gave up 262 authorizations in these "stand-alone" transfers.

As its contribution toward bringing AFLC's expenditures in line with its budget -- a major goal of the realignment -- SAAMA's Materiel Management Directorate lost another 303 authorizations. Actual movement of people and equipment began on April 16, 1976, and the reorganization was complete two months later on June 19. These losses, along with other programmed reductions, led to SA-ALC's first real RIF in over ten years.

Depot Modernization

Although budgets were tight in the 1970s, capital improvements postponed during the height of Vietnam finally came to the top of the priority list. And just in time. Most of the command's depot facilities were too small and out-of-date technologically. Over seventy percent of AFLC's industrial plant dated from the 1940s. Many of Kelly's maintenance buildings dated from the 1920s and 1930s; some were even built in 1917 and 1918. Warehouses were crowded, and a lack of sufficient covered storage space forced material and equipment to be kept outside, causing thousands of dollars worth of weather damage each year.

Command leaders rightfully believed that a five-year plan of construction projects for all the ALCs would have a better chance at funding than entering them piecemeal through the military construction budget process. Congress approved AFLC's Depot Plant Modernization Program, which began in fiscal year 1972. Over the next seven years new warehouses, materiel processing facilities, and maintenance buildings gradually replaced many of the antiquated structures across the command.

Construction of these new facilities on Kelly augmented and expanded SA-ALC's role as a vital logistics center. One of the more significant projects was the Jet Engine Overhaul Facility, building 360, completed on May 4, 1974. The $12.55 million, U-shaped structure provided 543,650 square-feet of space for a continuous flow of engine components from engine disassembly to reassembly and shipment. On June 30, 1975, SA-ALC accepted the new $3.07 million Plating Shop, building 301, which consolidated all plating operations under one roof. Construction of a new precision measurement equipment laboratory began on May 2, 1974. This facility, building 300, provided repair, calibration, and certification of precision measurement equipment requiring use of laboratory standards under closely controlled environmental conditions. The 39,900 square-foot building was completed on October 21, 1975, at a cost of $1.79 million.

Building 301, the new Plating shop.

First used in April 1980, the 26,677 square-foot Aircraft Engine Fuel Accessories Repair and Test Shop was one of the most valuable, at $9.9 million, and modern facility in the Maintenance area. Technicians in building 348 overhauled and tested the F100 unified fuel control system as well as the jet engine fuel control systems for the T56, J79, and TF39 engines.

FUEL ACCESSORIES
REPAIR & TEST
The new Aircraft Engine Fuel Accessories Repair and Test Facility, building 348, cost $9.9 million.

The command's Depot Plant Modernization Program added several state-of-the-art storage facilities to Kelly's list of buildings, allowing SA-ALC to consolidate storage facilities on main Kelly and eliminated the need for the San Antonio Air Force Station, nine miles away, as a materiel storage site.

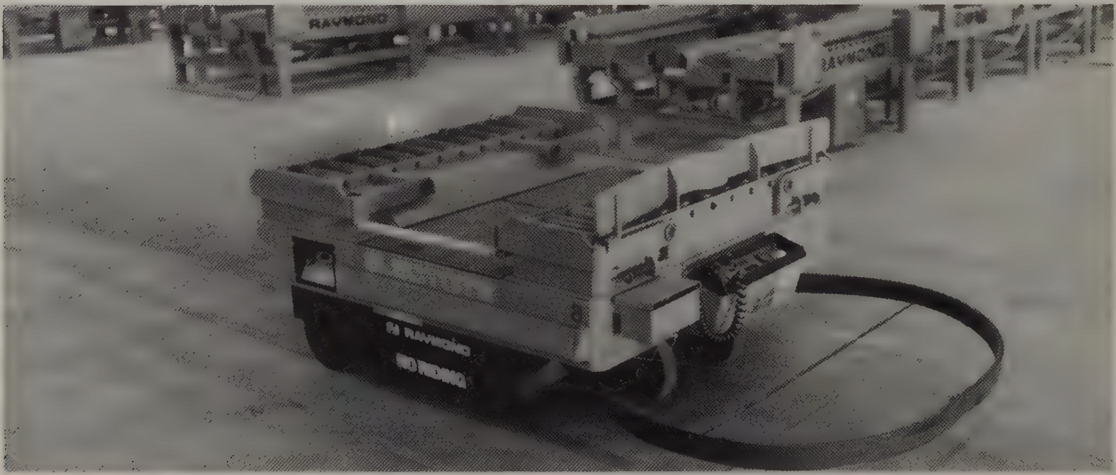
Kelly's new Jet Engine Overhaul Facility, building 360.

The Logistics Material Processing Facility, building 1537, was completed on June 15, 1974.

Furthermore, East Kelly's warehouses and storage yards, two miles from central receiving operations, were no longer required.

The Logistics Material Processing Facility, building 1537, centralized all receiving and shipping functions in one building. Completed on June 15, 1974, the $4.65 million facility contained a processing area, an administration center, a restaurant, and rail and truck docks. It was AFLC's first completely integrated receiving, packaging, and shipping facility. The new Hazardous Material Warehouse, building 1575, was completed on October 22, 1975, at a cost of $597 thousand. Planners designed the warehouse to provide safe storage space for flammable liquids and chemicals.

The Distribution area benefitted from another new facility, building 1538. The directorate took beneficial occupancy of this semi-bulk item warehouse on October 20, 1976, but did not begin operations until November 1977. Costing $7.9 million, the L-shaped building had 487,280 square-feet of storage space and replaced all the storage facilities on East Kelly. Building 1536, the bulk item warehouse, was completed in January 1980 at a cost of $6.9 million for the structure and $2.1 million for the mechanized material handling system. This machinery automatically transported material into and out of storage with a minimum of labor, doing the job faster and more economically than the human hands it replaced.



New mechanized material handling systems moved supplies in storage fast and efficiently.

Kelly mechanics worked twenty-four hours a day to keep C-5s flying during PROJECT NICKEL GRASS.

PROJECT NICKEL GRASS

While Israelis observed Yom Kippur on October 6, 1973, Egyptian soldiers crossed the Suez Canal, advancing into the Israeli occupied Sinai Peninsula. Syria subsequently attacked the Golan Heights on Israel's northern border, and the Middle East was at war again. The United States immediately began sending materiel to Israel in an effort to counter the massive Soviet arms shipments to Syria. PROJECT NICKEL GRASS was the code name for the delivery of war materials to those military bases designated as accumulation points for airlift to Israel. San Antonio Air Materiel Area became active in PROJECT NICKEL GRASS on October 9, 1973.

Kelly's Operations Center and the Directorates of Materiel Management, Distribution, and Maintenance were staffed for continuous duty, and personnel manned emergency operations centers to provide timely support. Directorate of Aerospace Fuels went on extended duty hours and the Logistics Readiness Center was activated in building 1680.

To maintain C-5 aircraft during the airlift, SA-ALC Maintenance personnel worked twenty-four hours a day to repair items that Military Airlift Command identified as critical. Maintenance workers refurbished gear boxes, fuel controls, generators, and oscilloscopes used in the airlift.

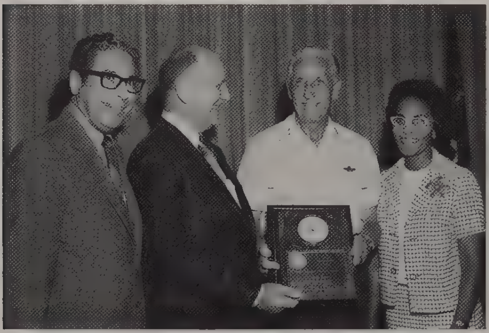
Directorate of Distribution supplied, packaged, and loaded more than a thousand items requested by the Air Force, including runway lighting fixtures, test stands, various gas turbines, J69 engines, and aircraft maintenance equipment. In addition, San Antonio Air Materiel Area supplied two seven-man loading teams to Wright-Patterson Air Force Base, Ohio, to support airlift operations.

San Antonio Air Materiel Area shipped 1,424 items for Israel, produced 1,308 support items, and worked 66,083 overtime hours. The approximate cost of PROJECT NICKLE GRASS was $848,200.

Organizational Changes

As SAAMA moved into the 1970s, the larger directorates remained essentially the same, although some went through a variety of name changes. On October 9, 1969, the Directorate of Air Force Aerospace Fuels dropped the "Air Force" from its name to eliminate organizational confusion. It remained the Directorate of Aerospace Fuels until August 1, 1975, when it again changed names, becoming the Directorate of Energy Management, reflecting a shift away from commodity orientation to functional operations. (Interestingly enough, the fuels organization reverted to its old name, the Directorate of Aerospace Fuels, again on December 1, 1988.) Another organization changed its name on January 1, 1970, when the Directorate of Supply and Transportation became the Directorate of Distribution. Eight years later, on December 1, 1978, the Directorate of Procurement and Production became the Directorate of Contracting and Manufacturing.

But besides these name changes, forces outside SAAMA and the Air Force prompted restructuring and creation of new organizations. Manpower reductions and grade roll-backs brought on by smaller budgets and a downsized force accounted for many of the division-level reorganizations, including those involved in the Technology Repair Concept and Item Management restructuring. But personnel problems of the Vietnam era and later--racial strife, the use of drugs, and alcohol abuse--spawned other new organizations as the Air Force sought for ways of dealing with these issues and the effect they had on the military and civilian work force.



Fernando Villasana (Chief, Equal Employment Opportunity Counselor), James Goode (Director of the Air Force EEO Program), and Zella Rainey (Federal Women's Program Manager), congratulate Major General William H. Reddell as he receives the first Distinguished Equal Employment Opportunity Award.

Racial tension reached the boiling point in the United States in the 1960s, and while the inner cities of Los Angeles and Detroit burned, Kelly simmered. San Antonio--and Kelly--Hispanics began organizing during this time to turn into reality the promises of the Civil Rights Act of 1964 and the subsequent Executive Orders that implemented the act. Equal employment opportunity (EEO) at Kelly, with over half of SAAMA's civilians Hispanic and most of them in lower grade positions, often turned into a matter of heated--and public--debate. At the invitation of several SAAMA Hispanics, civil rights commissioners held hearings at Kelly in the late 1960s. These hearings, hard-hitting newspaper articles, letters to congressmen, and a responsive commander helped break down barriers for Kelly's people.

Major General William H. Reddell came to Kelly in April 1969 with orders to fix "Kelly's people problems." One of the first things he did was to set up a community council consisting of Kelly union officials, SAAMA managers, and San Antonio clergy and business leaders. General Reddell took another step forward when he implemented new government-wide discrimination complaint procedures on July 1, 1969, by establishing the Special Assistant to the Commander for Equal Employment Opportunity, a manager who worked directly for the commander. For the first time, people not under the jurisdiction of the organization concerned investigated complaints. On September 14, he appointed Fernando Villasana to serve as SAAMA's first full-time EEO counselor. These initial efforts were so successful that General Reddell received the first Air Force Distinguished Equal Opportunity Award in September 1971. While discrimination did not end overnight, the EEO program at Kelly has made great strides over the last twenty-two years.

The Air Force hoped racial strife and drug abuse could be corrected through education or rehabilitation and established new organizations to provide this training. On November 10, 1971, Kelly opened a new Social Actions division within the Directorate of Personnel. This was elevated to a staff office, reporting directly to the commander, on April 10, 1972, to show the high degree of interest in Air Force "people problems." Social Actions personnel implemented all Air Force plans and policies relating to drug and alcohol education, race relations, and equal opportunity and treatment for military personnel.

Reflecting increased congressional interest in the military's efforts to encourage small businesses, SAAMA separated the Small Business and Contractor Relations Office from the Directorate of Procurement and Production on August 5, 1971, and established it as a staff office reporting directly to the commander to emphasize the military's small business effort, which had declined in the 1960s.

SAN ANTONIO ALC

The San Antonio Air Logistics Center

An end of an era in Kelly's history came on April 1, 1974, when Headquarters AFLC redesignated the air materiel areas as air logistics centers. General Jack Catton, AFLC Commander, believed the new name more accurately reflected the increased responsibilities carried out by the centers. After twenty-eight years, the San Antonio Air Materiel Area became the San Antonio Air Logistics Center (SA-ALC).

Quality Programs

Kellyites have always taken great pride in the quality of work they produce, but it can not be left to chance. For the first thirty years, inspectors tried to ensure products leaving Kelly shops were free of defects. But inspectors standing by to check each item as it rolled off the production line was too manpower intensive and time-consuming. Consequently, in the early 1950s, Air Materiel Command and SAAMA officials turned to private industry to see what it was doing to enhance the quality of its products.

After much study, Kelly's Directorate of Maintenance introduced a "new and effective tool for the guidance and improvement of production--Quality Control." While at first glance it appeared to be an updated version of the earlier inspection program, the driving force behind Quality Control was not finding defective products through inspection, but interest in the control of processes and machines so that production met certain standards. Quality could not be inspected into a product; it had to be built into it. Central to this new approach was the relatively new science of statistical quality control, a technique used to organize inspection results to reflect the normal capabilities of the process. In 1951, Maintenance officials established a team within the Production Inspection Section to implement the new program.

Continued interest in quality improvement caused AMC officials to create a comprehensive quality control program at both the headquarters and the AMAs. On November 1, 1953, SAAMA established an Assistant to the Commander for Quality Control (changed to Quality Control Office on February 2, 1955) to ensure an efficient quality assurance program within the AMA.

While the philosophy of quality control expanded during the subsequent years, going from a narrow definition of conformance of a product to certain specifications to encompass reliability of requirements to ensure supportability, transportability, and maintainability, its organization got smaller. Budget cuts in the early 1960s caused Headquarters AFLC to discontinue the Quality Control Offices at the AMAs, and on January 1, 1962, SAAMA decentralized its quality control responsibilities. Materiel Management established a Quality Control Branch, joining the other major organizations which already had quality control functions.

Kelly's program remained decentralized for the next ten years, until Headquarters AFLC once again decided to centralize. On January 1, 1975, SA-ALC established the position of the Special Assistant to the Commander for Quality Assurance to serve as a coordinator and adviser for the ALC's quality efforts and to act as a focal point for complaints from the using commands.

Kelly workers have always been proud of the quality of their work.

This office lasted another ten years before budget constraints forced AFLC to look for manpower savings, and once again the quality assurance function was a prime target for elimination. In 1986, AFLC leaders approved decentralization of the command's quality assurance organizations. At SA-ALC, this meant closing the quality assurance office and dividing its reduced manpower authorizations among the directorates. The center also established a Quality Council with a new position in the Inspector General's office to serve as focal point.

But things never remain static for long. In August 1987, AFLC's new commander, General Alfred G. Hansen, astonished the command by reemphasizing the values of centralization. At a December 1987 Quality Council meeting, General Hansen stated, "The time has come for us to shift our emphasis away from evaluating the goods and services we provide at the end of the process...and toward the process itself by which goods and services are actually provided." Although this idea was over thirty years old, General Hansen's interest caused a dramatic shift in AFLC's quality philosophy. The new command quality effort represented a change in culture; quality was now everyone's business. Allegiance to quality started in the commander's office and "cascaded" down to every person in the command.

Looking for a way to summarize the main points of the new process-oriented program, General Hansen came up with the idea of QP4--Quality = People + Process + Performance + Product. To facilitate the command's march toward quality, General Hansen reestablished the position of Assistant to the Commander for Quality Programs at the headquarters and directed the ALCs to set up equivalent offices; SA-ALC's new quality organization opened in January 1988. To be effective, the new command philosophy could not be regulated. Instead, AFLC's Assistant for Quality published a "Quality Bill of Rights" to help the command's workers realize they were an essential part of the quality program.

But AFLC was not alone in its push toward quality. Faced with declining budgets and embarrassed by an inefficient, uncoordinated acquisition system, the Defense Department embarked upon a master plan for improved quality entitled Total Quality Management (TQM). Very quickly TQM subsumed AFLC's program, since much of QP4 was an integral part of the larger plan. Cascading, personal responsibility, process awareness, and customer orientation were the pillars upon which TQM (and QP4) was built.

Total Quality Management revolutionized the ways in which SA-ALC, and indeed all AFLC, workers viewed their jobs. Although they took to the new ideas slowly at first, once they saw TQM was not just another "fad," Kellyites embraced the challenge of taking greater responsibility for the quality of their work. Their commitment to continuous process improvement was real. Although AFLC's revised quality program was relatively new, the command won the President's Award for Quality for 1991. San Antonio shared in that honor and also was one of the winners of the 1991 AFLC Quality Improvement Prototype Award. But the real winner of the command's quality program was the United States Air Force with the improved levels of excellence of AFLC products and services.

AIR FORCE LOGISTICS COMMAND

QP4 = PEOPLE, PROCESS, PERFORMANCE AND PRODUCT

QUALITY BILL OF RIGHTS

This document supports the creation of an environment of trust throughout AFLC. It encourages each member of the Command to initiate responsible actions that will contribute to safety, quality and productivity. The sensible exercise of these rights will result in improved products and services. Each member of the Air Force Logistics Command shall have the following Quality **RIGHTS:**

- The **RIGHT** to challenge business as usual
- The **RIGHT** to be heard
- The **RIGHT** to expect commitment to quality
- The **RIGHT** to place quality before production
- The **RIGHT** to feel genuine pride in AFLC products and services

AFLCVA 190–32
March 1991

Fly Me to the Moon

When John Kennedy became President in 1961, one of his goals was the revitalization of America's space program. This effort culminated on July 20, 1969, as Astronaut Neil Armstrong became the first man on the moon. Kelly people shared in this glory.

In 1964, Kelly Maintenance workers built three Apollo capsule trainers for the National Aeronautics and Space Administration (NASA). Engineers used the first trainer to provide flotation data in training people to recover astronauts at sea. Astronauts themselves practiced emergency egress procedures in the second trainer, simulating sea recovery in a large tank full of water. The third was used in acoustical research to control and abate noise within manned spacecraft.

During 1965, Kelly technicians built a human transverse "G" (or gravity) couch for the United States Air Force School of Aerospace Medicine at Brooks Air Force Base, Texas. Astronauts and research pilots used the couch during centrifuge testing to determine the degree of response and tolerance to various acceleration forces. Scientists also used another couch Kelly workers made for animals for research in predicting the effects of sustained or high "G" forces on human cardiorespiratory systems.

Air Force Logistics Command technicians put the finishing touches on one of three Apollo capsule trainers built for the National Aeronautics and Space Administration.

Photo Below: Kelly people were justifiably proud of the contributions they made to get a man on the moon.

A space shuttle piggy-back on its mother ship touches down at Kelly.

Kelly's Directorate of Aerospace Fuels has supplied propellants and pressurants for NASA since July 1966. Fuels personnel supported all seventeen Apollo launches. For Apollo 11, for example, 1,680 tons of liquid oxygen and 1,220 tons of liquid nitrogen arrived at the Kennedy Space Center in Florida between June 26 and July 16, 1969. One day after the launch, 4,703 tons of liquid oxygen and 1,355 tons of liquid nitrogen were in storage tanks at the space center. Approximately $350 thousand of San Antonio Air Materiel Area supplied fuels and pressurants were used to get Neil Armstrong on the moon.

While the Apollo program ended with the launch of Apollo 17 on December 6, 1972, Aerospace Fuels support of America's space program continued, turning to Skylab, the country's first orbiting space station, launched on May 14, 1973. Kelly's support was similar to that provided during the Apollo program; Aerospace Fuels personnel were at the space center to coordinate propellant loading and were available in case any problems developed in the delivery of the needed pressurants and propellants.

On March 22, 1979, thousands of people lined the roads adjacent to Kelly's runways to catch a glimpse of the space shuttle "Columbia," perched atop its Boeing 747 mother ship, during its first refueling stop on its way to the Kennedy Space Center. This, perhaps, was Kelly's most dramatic and visible participation in the space program. In the ensuing twelve years, the sight of the space shuttle, piggy-back on its mother ship, continued to draw crowds of curious onlookers.

Apollo 11 burned over $350,000 worth of fuel on its trip to the moon and back. That may sound like a lot of money, but averages out to only 73 cents per mile.

Kelly played host to another unique craft in October 1979 when the National Aeronautics and Space Administration's "Super Guppy," made from parts of a Boeing 373 and a C-97, arrived so San Antonio Air Logistics Center mechanics could replace its landing gear. The whale-like airplane returned to Kelly occasionally for maintenance or when its home base, Ellington Air Force Base near Houston, Texas, expected bad weather.

In 1983, President Ronald Reagan announced the establishment of a comprehensive research program to eliminate the threat posed to the United States by nuclear ballistic missiles -- the Strategic Defense Initiative, or SDI.

By 1987, much of SDI research had reached the initial demonstration state, and Headquarters Air Force Logistics Command made lead air logistics center assignments for the six major SDI systems for which it was responsible. Assignment of the space-based servicing system came to the San Antonio Air Logistics Center. While still in the planning stages in 1991, the space-based servicing system was the "front runner" of SA-ALC's involvement in future space programs.

NASA's "Super Guppy" stopped at Kelly AFB in October 1979 for replacement of its landing gear.

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The Age of Computers

Information is essential to logistics operations, but of all logistics operations, information flow was the slowest and most unwieldy. Realizing that computers could store and manipulate data, and turn out management products quickly and efficiently, AFLC began using them as early as 1954. By 1962, all materiel support managers depended on automatic data processing for at least part of their operations.

In 1965, AFLC employees recorded management information on 420 different mechanized data systems located in about 125 computers. Most were second generation and had no ability to interface or share common data; these computers relied on manual batch processing of transactions, which caused delays and inaccuracies. Command managers wanted a single, real-time, all encompassing system to manage their logistics operations. The Advanced Logistics System (ALS) was to be the solution. Using third generation computers, ALS would replace 104 data systems, modify six others, and interface fifty-six more. The plan called for data to be stored in one unified data bank at each ALC and the headquarters. Managers would use remote terminals to access the unified data bank at their base and those at other AFLC locations. Designed for extensive interfacing among separate information systems, ALS represented pioneering efforts in integrated system design.

Despite the high cost (estimated at $370 million) and the length of time before the system would become fully operational (seven years), Headquarters Air Force approved ALS in 1967. To make the investment more palatable, AFLC officials quoted savings in excess of $490 million (including those associated with manpower reductions) in addition to the return in increased readiness.

Command planners divided responsibility for development and design of ALS among the five ALCs and the headquarters. San Antonio was responsible for the Organic Depot Maintenance Workload Scheduling and Reporting process; the contract repair portion of the Depot Level Maintenance Resources Planning and Management process, which Headquarters AFLC took over in April 1974; the networks portion of the Depot Maintenance Production Planning process; and the Nuclear Ordnance Logistics Support (NOLS), a system unique to SA-ALC's Directorate of Special Weapons. Unfortunately, this divided responsibility fragmented the functional design of the system and contributed to inadequate coordination.

Numerous problems came up during development of ALS, but given its size and scope, this was not unexpected. State-of-the-art, but unproven, technology was incorporated into ALS, and when the contractor-designed software failed its initial test late in 1972, AFLC redesigned its plan, delaying the schedule. In February 1973, AFLC named San Antonio as the lead ALC to implement the first phases of the revised schedule. Several months later, SA-ALC's vice commander approved establishment of the ALS Control Group, which AFLC nicknamed PACER BYTE, to manage the implementation at San Antonio. By October 1973, the computers for the main ALS system (in building 1621) and NOLS (in building 1420) were up and running. By the following June, 472 remote terminals at various places on base were on line, and SA-ALC computer specialists had implemented all or part of five out of ten ALS phases.

Despite progress made at SA-ALC, ALS was in serious trouble. In August 1974, the AFLC commander had to inform the Air Force Chief of Staff that the command could not implement ALS within the time and budget limits set. It needed another year to redesign the program from ground up, but Air Force Logistics Command had run out of time. Congress refused to put any more time or money into ALS. Although it appropriated money to buy the main computers, Congress instructed the Air Force to terminate ALS in December 1975. Many of the problems stemmed from ALS's design and implementation concept.

By 1962, all materiel managers depended on computers for at least part of their operations.

Computer technology of the 1970s was not advanced enough to support the total program. Software development and hardware acquisition were done separately. Only late in the program did AFLC realize what the computers actually could do, and as designed, the software exceeded the capabilities of the hardware. Furthermore, AFLC's plan called for installing the hardware and software, interfacing the systems, and fully supporting the customer all at the same time--an unrealistic goal. Although AFLC expected ALS to provide significant manpower savings, withdrawing a total of 843 authorizations by the end of 1978 from SA-ALC alone, ALS made work: not only did the ALCs run parallel systems longer as implementation schedules slipped, but continual system redesign required even more manpower support.

By the time ALS officially "expired" in December 1975, NOLS was a going operation. Headquarters AFLC had transferred NOLS support and maintenance responsibility to San Antonio six months earlier. While less ambitious than the rest, NOLS was the only segment of ALS successfully developed and implemented as originally designed. Inventory managers, using fourteen remotes, accessed the NOLS central data bank for worldwide visibility of the nuclear weapons and assets they managed.

Although ALS did not live up to expectations, AFLC and the ALCs gained much hard earned knowledge. They learned that some sort of integrated logistics information system was necessary if AFLC wanted to continue using computers to manage Air Force resources, but they had to be upgraded for reliability. And the system had to be designed, procured, and implemented in an integrated fashion, completely installed, tested, and major problems solved one site at a time. These lessons proved invaluable for AFLC's next attempt to modernize its information systems.

It became imperative for AFLC to replace its aging computers by the late 1970s.

CONTROL DATA
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Logistics Management System Modernization Plan

Air Force Logistics Command officials faced several serious consequences at the end of ALS. A number of new aircraft, programmable material handling equipment, digital avionics and automatic test equipment, guided weapons, and modular engines and weapons had entered or were soon to enter the Air Force inventory. At the same time, manpower had declined dramatically, increasing the command's reliance on automated information systems. But no major improvements had been made to AFLC's logistics management system since 1967. To make matters worse, Congress, the Office of the Secretary of Defense, and the Office of the Secretary of the Air Force did not believe that AFLC could be trusted to manage a large ADP modernization program.

It took AFLC officials two years to overcome that lack of credibility, but by the end of 1978, the command had a new and approved program. Revised in the early 1980s to integrate and synchronize hardware and software acquisition, the Logistics Management System (LMS) Modernization Plan was an umbrella program to replace AFLC's old ADP equipment and data systems, carrying the command into the 1990s. It used commercial, off-the-shelf, proven technology. While AFLC officials and various contractors developed each information system independently, planners ensured software design matched hardware capabilities. Problems were inevitable and schedules delayed, but the LMS Modernization Program succeeded where ALS did not.

The first part of the plan called for replacing the command's antiquated IBM 7080 computers with new Control Data Corporation's CYBER and IBM 360-65 machines, which was done relatively quickly. Consequently, for most of the 1980s, emphasis was on the data systems and the communications network that linked them all together.

In 1987, SA-ALC had 208 individual data systems, running on twelve different computers, which ran the gamut from tape-driven technology to a limited number of on-line systems. By 1991, the situation had improved dramatically. The LMS portion of the modernization plan consisted of seven projects, consolidating many of the old information systems and providing real-time capability. One of the first systems to come on line was the Requirements Data Bank (RDB), which allowed managers to compute requirements and budget projections for their systems while assessing the impact of policy changes on the logistics pipeline. It reached initial operating capability in August 1985 and further improvements to RDB were on going.

To reduce the time-consuming effort of manually processing contracts, AFLC designed the Contracting Data Management System and divided it into two phases; the first was complete at SA-ALC in August 1987, cutting purchase request processing time by one-third. Work on the second phase continued into fiscal year 1992. The command designed the Stock Control and Distribution System to support the total distribution function, from processing and tracking requisitions to storage management as well as allocating and moving AFLC inventory. This system came on line at SA-ALC in April 1991.

The Depot Maintenance Management Information System (DMMIS) was designed to support the final core logistics function, depot level maintenance. Another extremely complex information system, the first portion of DMMIS, the Exchangeables Production Subsystem, came on line in July 1987. Implementation of the Manufacturing Resource Planning System, scheduled for 1993, would complete the DMMIS package.

Besides the hardware and software programs, the communications network which linked core and supporting systems and gave them worldwide accessibility consisted of intrasite and intersite networks and a gateway to connect the two. San Antonio ALC's Local Area Network, or LAN, provided terminal-to-computer and computer-to-terminal communications. It not only connected the various LMS programs, but also provided a means for communicating within the ALC and between ALCs and the headquarters. Installation of SA-ALC's LAN began in April 1986. By October 1989, twenty-two buildings were connected to it, while fifty-five more had access via modem links. The Intersite Gateway provided access to the rest of the Air Force via AUTODIN in March 1988 and the Defense Data Network in May 1989.

In addition to the systems which supported the four core logistics functions, the LMS Modernization Program included information systems which made the job easier. The Weapon System Management Information System provided strategic information to manage aircraft, spares, munitions, and support equipment. It became fully operational at SA-ALC in October 1987. The Engineering Data Computer

President Lyndon B. Johnson praised the C-5 at roll-out ceremonies at Lockheed's Marietta, Georgia, plant. The President termed the occasion a "long leap forward in the effective military might of America."

Assisted Retrieval System was designed to update and store digitized engineering drawings and reached final operating capability in February 1988.

The Automated Technical Order System provided automated updates to Air Force technical order text and drawings. Although it became operational in March 1987, the process of automating all of SA-ALC's information was an on-going process. Reaching full capability in September 1988, the Battle Staff Management System provided secret-level connectivity between Kelly's command post and those across AFLC. Comptrollers used the Central Procurement Accounting System to maintain up-to-the-minute visibility of expenditures in central procurement accounts. Designed to track the performance of parts and equipment, the first module of the Reliability and Maintainability Information System came on line in February 1990.

Despite the inevitable problems and schedule slips, the LMS Modernization Program was a success. The Air Force reaped a savings of $346 million with just six of the programs. A recent U. S. House of Representatives Appropriations Committee report even stated the program was one of the most successful computer acquisitions efforts ever fielded. The command had come far since ALS.

The C-5 "Galaxy"

On March 2, 1968, President Lyndon B. Johnson spoke to an assembled group of dignitaries at a ceremony marking the roll out of the first C-5 cargo transport from the Lockheed plant in Marrietta, Georgia. President Johnson stated:

> "The C-5A Galaxy can only be described in most extraordinary terms--it is the biggest aircraft in all the world. Its cargo floor alone is longer than the first flight that was made by the Wright Brothers. Its jet engine is twice as powerful as any that is now in existence. It can do three times the work of the biggest cargo plane that the United States now has. It cuts operation expenses almost in half. It can span the Pacific, from California to Japan, in one single jump. But most important of all: for the first time, our fighting men will be able to travel with their equipment to any spot on the globe where we might be forced to stand--and they will travel rapidly and efficiently.So it is much more than a roll out of a great aircraft that you are seeing here today. We are observing a long leap forward in the effective military might of America."

The C-5 was indeed a giant; the aircraft was more than 230 feet long, with a 220-foot wing span and a tail sixty-three feet high. Its crew sat in a cockpit fifty feet off the ground. Designed to accommodate various load configurations, the giant transport could carry 125 tons 3,200 miles or fifty tons one way across the Pacific Ocean. It could carry ninety-eight percent of an Army division's equipment, including M-60 main battle tanks, helicopters, and missiles.

Initially, the Air Force planned on outfitting three squadrons located at Charleston AFB, South Carolina; Travis AFB, California; and Dover AFB, Delaware; and a transition training unit at Altus AFB, Oklahoma, with a total of fifty-eight aircraft. Development and initial production costs, including the TF39 engine, totalled approximately $2 billion.

Early Management Planning

Even before the C-5's first flight at 7:47 on the morning of June 30, 1968, San Antonio Air Materiel Area personnel had been deeply involved in planning its logistical support. Headquarters AFLC named SAAMA as the C-5 System Support Manager on October 8, 1965, and the Specialized Repair Activity for its structural components on January 8, 1966. Over the next few years, virtually everything connected to the C-5, from its aerospace ground equipment to its malfunction analysis detection and recording subsystem, became a Kelly responsibility. San Antonio AMA officials viewed this assignment as a prize of great magnitude and importance. They were not alone. Several AMAs bid for the assignment, which all realized would entail a large work load in the future, but SAAMA won the spirited competition.

On March 10, 1966, SAAMA sent one of its managers to the Lockheed plant in Marietta, Georgia, to serve as the Resident Provisioning Team Chief. Two months later, San Antonio Air Materiel Area contracting experts began work on the Integrated Logistical Support Provisioning Plan.

mechanization of the logistics system to support C-5 provisioning was a new step in weapon systems procurement. On September 11, 1968, seventy people from the Directorate of Maintenance began system training at the Lockheed plant. Technical training of the military personnel who would maintain the C-5 began at Chanute AFB in Illinois, Keesler AFB in Mississippi, and Sheppard AFB in Texas.

The first Air Force "owned" C-5 arrived at Edwards AFB, California, on June 4, 1969, for sixteen months of flight and other types of testing. On December 17, 1969, Lockheed turned over the first operational C-5, which immediately flew to Altus AFB for crew transition training. This event also marked the beginning of SAAMA's job of logistical support for the operational C-5 fleet. On January 1, 1970, LOGAIR service began between Kelly and Altus to ensure timely parts support for the transition training unit.

The C-5A's Early Years

Major General William H. Reddell, SAAMA Commander, and a group of local dignitaries were on hand on January 30, 1970, to greet the first C-5 to land on Kelly. The aircraft flew in from Edwards AFB for an open house. Thousands of people from the local area came to Kelly to inspect the Air Force's newest airlifter. After this one-day stop, the C-5 returned to Edwards for further testing, but it gave San Antonio its first chance to see the giant transport that would become a familiar sight over the city during the next two decades.

Kelly's major work load during the first few years of the C-5's operational life centered around ensuring the activation of the new C-5 squadrons, in terms of logistical support, went as smoothly as possible. On December 8, 1969, Headquarters AFLC gave SAAMA responsibility for the Lead-the-Force-Program (later changed to Lead-the-Fleet), an accelerated flying hour program for selected aircraft, engines, and components to analyze the aircraft and identify any weaknesses in the structure and systems so corrections could be made before catastrophic failures occurred or fleet-wide problems surfaced. Kelly managers selected five aircraft from different production blocks to enter the accelerated flying hour program, which began on April 3, 1970. Four years later, in August 1974, aircraft number 68-0222 reached the desired two-year lead in operational flying hours over the rest of the fleet. During the next six months, the other C-5s in the program reached the two-year milestone.

Charleston AFB's 437th Military Airlift Wing was the first operational unit to receive C-5As. On June 6, 1970, the wing began flying strategic airlift missions under the operational test program. Less than a month after these tests began, the C-5 completed its first overseas cargo mission. It left Charleston during

Touchdown - the first C-5 landed at Kelly at 11:15 am, January 31, 1970.

Facing Page: About 65,000 people from San Antonio came out to Kelly's Open House on January 31, 1970, to get a close look at the gigantic C-5.

the 4th of July weekend, flying 21,500 miles in ten days and touching down at six Pacific Air Forces bases before returning home. Nicknamed PROJECT FOXTROT, the mission demonstrated the aircraft's operational capability and provided training for ground crews in the Pacific.

Delivery of the first aircraft to Travis AFB occurred on October 23, 1970. Dover's squadron received its first C-5A on April 1, 1971. The last C-5A squadron, activated in February 1972, was also at Travis.

On May 18, 1973, Lockheed delivered its final C-5A to the Air Force. Originally, the Air Force intended to buy 120 of the giant transporters, but immense cost overruns forced this number to drop to eighty-one. With acquisition of the last A-model, SAAMA C-5 managers logistically were responsible for a fleet of seventy-nine aircraft (two had been lost previously to accidents).

Maintenance

During the early 1970s, concurrent aircraft production, testing, operations, and updates made life challenging for those involved in the C-5 program. These first years of parallel testing and operations revealed many reliability problems. As problems were uncovered, Lockheed engineers made improvements and developed numerous component configuration changes, which they not only incorporated in new production models, but also added to aircraft already turned over to the Air Force. Beginning in fiscal year 1971, C-5 engineers divided the various engineering change proposals (ECPs) and time compliance technical orders (TCTOs) that incorporated the system design changes into "increments," a set of specific changes on specific aircraft. Not all fixes applied to all aircraft. Consequently, the number of manhours spent actually doing the work at either the Lockheed plant or Kelly shops depended on the ECPs or TCTOs to be performed. Some of the most time consuming work in the early 1970s involved modifications to strengthen the airframe and installation of new pylons (dubbed the "Maxi-Mod") to prevent the engine from separating from the aircraft.

The first C-5A to come to Kelly for maintenance, in this case TCTO system update work, arrived from Charleston AFB on April 19, 1971. It touched down at 1:10 p.m. to the strains of "Those Magnificent Young Men in Their Flying Machines," played by the Air Force Band of the West. Over a thousand people, including local media representatives, attended the brief ceremony. Immediately after the event, workers moved the C-5 to pad number 32 on the hard stand area for maintenance. San Antonio AMA staff members knew this was just the start of a maintenance work load that gradually would grow to enormous proportions.

The C-5 was so large, maintenance of the giant "bird" required ingenuity and a lot of special equipment.

Over a year later, on August 1, 1972, aircraft number 68-0222 arrived at Kelly for programmed depot maintenance (PDM), the first C-5 to do so. All previous C-5 work done at Kelly was the result of the previously mentioned updates and system design changes. Most of these "fly-ins" (aircraft with essentially unscheduled maintenance) were in the shops for one-time-only or emergency work. Programmed depot maintenance, successor to the Mod/IRAN program begun in the 1950s, marked the emergence of the C-5 as a more stable system in which depot level maintenance could be scheduled and planned in advance.

San Antonio C-5 program managers initially scheduled eighteen C-5s for the first year of programmed depot maintenance; however, a significant learning curve, leaks discovered during fueling operations, and unexpected problems with the landing gear, delayed completion of the PDM work. In addition, an increased requirement for B-52Ds drew workers from the C-5A PDM line. To speed up the PDM effort, on July 25, 1973, Headquarters AFLC approved establishment of a fourth aircraft position in building 375 for C-5 PDM. Immediately, Kelly engineers began working on a device to tow a C-5 in and out of the huge hangar. Maintenance workers used it for the first time on December 11, 1973.

C-5 Paint Job

An aircraft as huge as the C-5 provided countless challenges to those maintaining it. One of these was painting the giant bird. While SAAMA personnel had painted numerous types of aircraft over the years, including a complete camouflage paint scheme for the B-52 during the Vietnam War years, they had never done a stripping and repainting job of the magnitude required for the C-5. In preparation, SAAMA awarded a $2.2 million contract to turn building 365 into a suitable facility. Completion of the construction project on June 15, 1972, provided a one-of-a-kind facility that was big enough for the C-5 as well as explosion-proof, air-filtered, and temperature-and-humidity-controlled. And it was finished just in time.

Colonel B.W. Bodager, San Antonio Air Materiel Area's Director of Maintenance, welcomed the crew of the first C-5 that arrived at Kelly for maintenance.

Painting the C-5 required modification to the paint and corrosion control facility.

During 1971, an engineering team inspecting six C-5 aircraft found the exterior paint beginning to crack on the upper wing surfaces, exposing the inner and outer wing boxes to corrosion. Common, too, was a loss of paint on the bottom of the rear fuselage. The solution, directed in February 1972, was the corrosion-preventive paint project, which involved stripping the acrylic lacquer paint, cleaning and treating the metal, and completely repainting the exterior with polyurethane paint. With the unique capabilities of the painting facility in building 365, workers were able to repaint a C-5 in only eleven days. Nevertheless, the sheer size and height of this oversized aircraft tested the ingenuity of Kelly workers.

During this initial painting of the C-5A fleet, Kelly workers used the traditional Military Airlift Command (MAC) white and gray color scheme. In 1980 the Air Force looked at the possibility of repainting the C-5 with the camouflage scheme used on most of the aircraft in advanced forward areas, including Europe where the C-5A fleet played an important role. On January 29, 1981, Headquarters Air Force approved MAC's request to camouflage the fleet with a paint scheme known as European I, a three-color pattern of shades of two green and one of gray. After much debate, SA-ALC's C-5 managers decided that Kelly's maintenance workers would repaint the C-5s during a "mini-programmed depot maintenance" (a limited range of depot-level maintenance items). Work began on the prototype on May 9, 1983, and finished on June 20, twenty-three days ahead of schedule.

C-5 Wing Modification Program

When Lockheed won the contract in December 1965 to build the C-5A, the Air Force required certain performance specifications, such as take-off and landing distances and weight requirements, for the new cargo plane. But during its development, Lockheed engineers realized the plane would not be able to meet the specified weight requirements. To decrease the total weight of the aircraft, Lockheed decided to reduce the weight of the wings, using thinner wing boxes. They opined that with use of new fastener techniques and increased quality control efforts, the thinner wings would be strong enough to meet the desired service life of 30,000 flying hours. During static testing of the wings in July 1969, one failed when carrying 124 percent of the load limit. Engineers corrected this deficiency with a structural modification.

In January 1970, just one month after delivery of the first production aircraft, fatigue cracks were discovered in the wings of the flight test aircraft. Fatigue testing of the redesigned wings also began at this time. The Secretary of the Air Force asked the Air Force Scientific Advisory Board to study the wing failures. After several months, the board concluded the C-5A wing would not reach the goal of 30,000 flying hours. Lockheed continued special "beef up" retrofits to strengthen the wing boxes, but these modifications increased the wings' service life only to 8,000 hours, clearly below the Air Force's specifications.

In September 1971, the Air Force limited the load the C-5A could carry to 174 thousand pounds or eighty percent of that specified in the contract. In March 1973, the Secretary of the Air Force selected an active lift distribution system as an interim measure to reduce stress on the C-5 wings. He also approved a major wing modification program to achieve the desired 30,000-hour service life.

A year later, April 1974, Lockheed submitted a proposal to replace the inner and center wing boxes and strengthen the outer wing box on the lower surface. But the price tag was high. Estimates for the research alone reached $22 million, while the overall project was priced at more than a billion dollars. On December 23, 1975, the Air Force awarded a $28.4 million contract to Lockheed-Georgia to study methods to modify and strengthen the C-5's wings. The Air Force modified the contract in 1976 to include replacing the outer wing box.

In 1983, Kelly workers began camouflaging the C-5 fleet with the European I paint scheme.

As early as 1970, the Air Force recognized the need to modify the C-5s wings.

The contract was divided into four phases. An initial $4 million went toward the first phase of engineering analysis and testing. During the second phase, Lockheed was to fabricate kits and associated hardware for two wing sections. (A kit consisted of parts designed for assembly on one aircraft of a multi-aircraft requirement.) The plan called for Lockheed to install one of these kits and then subject the aircraft to extensive fatigue testing, while the other kit would be installed on a C-5 for flight testing. The final two phases involved kit fabrication for all C-5As and kit installation at the Lockheed plant. Although the size of the C-5A fleet was small, at this time seventy-six aircraft, the wing mod program would last for five years, 1982 through 1987.

Responsibility for the design and test phases of the modification project belonged to Aeronautical Systems Division of the Air Force Systems Command. San Antonio Air Logistics Center managed the final two phases, fabrication and installation. On December 20, 1978, SA-ALC Commander, Major General Lynwood E. Clark, approved establishment of a C-5A Modification Program Management Office within the Directorate of Materiel Management to oversee all work under the production contract. With the high dollar value of the contract and the length of time involved, SA-ALC managers deemed it prudent to have some center personnel on-site to work the many issues that would arise. In September 1981, SA-ALC established an operating location at Lockheed's Marrietta plant to work with the Air Force Plant Representative Office to ensure compliance with contract specifications and to coordinate and evaluate proposed changes. Originally staffed with five people, this expanded to eighteen as production of modified aircraft increased.

Lockheed engineers reached a significant milestone on May 9, 1980, when the wing they were fatigue-testing reached the 30,000-hour level of operation, four months ahead of schedule, with no significant problems. They decided to continue the fatigue testing for another 30,000 hours to see if and when problems would occur. Just before the wing reached the 60,000-hour point, cracks appeared in a fitting outside the wing box where the wing and fuselage met. Lockheed's designed fix easily met the Air Force's specifications. In addition, the Air Force Scientific Advisory Board met between July 1 and 2, 1980, to review the results of the first fatigue test. It recommended continuing the wing modification program.

Another milestone for the wing mod program occurred during the summer. On May 14, 1980, Lockheed thought the other modified aircraft was ready for its flight test, but a final X-ray inspection of the wing tip revealed moisture and corrosion. It took three months to correct the problem and develop an ultrasonic inspection technique for the wing tips, flaps, ailerons, and slats. A combined Air Force and Lockheed crew finally tested the C-5 during a four hour and twenty-five minute flight on August 14. The success of this first flight led to fifteen more through October for a total of fifty-four hours and twenty-one minutes of incident-free flying time.

Fabrication of the wing boxes already had begun. On January 7, 1980, workers at Avco Incorporated, Memphis, Tennessee, a subcontractor to Lockheed, began manufacturing the wing boxes. Final go ahead for installation was authorized in November 1981 when the Air Force exercised its 1982 option for modification of five aircraft. A MAC crew flew the first C-5A to be modified to the Lockheed-Georgia plant in January 1982. Lockheed completed this aircraft and returned it in May 1983.

Once begun, production of the modified C-5As progressed smoothly. Lockheed delivered all the aircraft on time or ahead of schedule. On July 7, 1987, Lockheed workers finished the last C-5A, bringing to a close the largest modification program ever managed by SA-ALC, or any other ALC .

The C-5A Wing Mod Program came in approximately $200 million under budget, an achievement of which all concerned could be proud. At the ceremony marking the end of the program, Colonel Ronald Roberts, SA-ALC's Director of Materiel Management, stated that the program was "...an extremely successful, superbly managed effort...." Major General Lewis G. Curtis, SA-ALC Commander, added, "With the completion of the wing modification, the Galaxy, the Air Force's largest airlifter, will proudly fulfill its role into the 21st century."

The silhouettes of two aircraft mechanics working high on the wing of a giant C-5 Galaxy look small as one of the cargo carriers is overhauled for the Air Force at SA-ALC.

SARPMA and the Drive Toward Consolidation

In an effort to save money, the General Accounting Office and later the Department of Defense, pushed for consolidation of similar military organizations located in the same geographic area. San Antonio, with four air force bases and one Army post, was a prime candidate for this type of merger. With this in mind, the Air Staff decided to consolidate base-level contracting for San Antonio's four air force bases, and on January 1, 1977, the San Antonio Procurement Center (later changed to the San Antonio Contracting Center or SACC) located on Kelly Air Force Base came into being. A year and a half later, centralization struck again. On October 1, 1978, the San Antonio Real Property Maintenance Agency (SARPMA) became responsible for real property maintenance for military facilities in the San Antonio area, primarily Fort Sam Houston and Brooks, Kelly, Lackland, and Randolph AFBs. Personnel for the agency, located at the San Antonio Air Force Station on Fort Sam Houston, came from the five installations. Kelly contributed 721 military and civilian authorizations from its civil engineering division and associated support organizations.

From the beginning, SARPMA faced an uphill battle for support. None of the area commanders viewed a consolidated maintenance organization with any favor. They feared a loss of mission responsiveness and direct control over a major resource. Any new organization suffers from growing pains, and SARPMA wasn't any different. But SARPMA's growing pains, resulting customer dissatisfaction, and a move away from centralization in the 1980s, contributed to its demise eleven years later.

The Air Force tried to move away from SARPMA as early as 1983. San Antonio Air Logistics Center leaders and their counterparts at Headquarters Air Force Logistics Command were steadfast in their desire to extricate themselves from both SACC and SARPMA, firmly believing the consolidated agencies never adequately supported the contracting and civil engineering requirements at Kelly's huge industrial complex. An AFLC study comparing facility projects among the five air logistics centers showed that Kelly received forty-five percent less real property maintenance per square foot with SARPMA than the other bases with their own civil engineering organizations.

Eight years of experience with the consolidated agency, extra costs, continuing perceptions of unresponsiveness, and the extensive management efforts required to make SARPMA work, convinced the major air commanders that the two consolidated San Antonio agencies should go. Pulling Kelly's base contracting business from SACC proved relatively easy. By April 1986, the phased transfer of the center's contracting work load began. However, getting Army approval to disestablish SARPMA and SACC took another year.

Finally, in April 1988, the public announcement concerning the disestablishment of the two agencies by October 1, 1989, was made. On July 1, 1988, Kelly activated the 2851st Civil Engineering Squadron. Plans called for the new unit to gradually absorb SARPMA's work loads, equipment, and as many of its people as possible.

Monday, October 1, 1989, marked both a beginning and an end. It was the first workday for Kelly's fully reestablished civil engineering squadron and the day eleven-year-old SARPMA officially ceased to exist. But the lure of manpower and budgetary savings promised by centralization and consolidation is very seductive. Who is to say that the "son of SARPMA" isn't just around the corner?

The C-5B Program

World events in 1979 and 1980, the failed hostage rescue attempt in Iran and the Soviet invasion of Afghanistan and intervention in Poland, convinced the Department of Defense that its existing airlift fleet was too small to meet the current and projected demands American international policy placed on it. To improve intertheater airlift capability and enhance the United States' ability to transport and sustain American military forces on a global basis, the Air Force awarded a contract in 1981 to Lockheed-Georgia for acquisition of fifty C-5B aircraft. San Antonio ALC, manager of the C-5A, received system program management responsibility for the B model as well.

Lockheed designed the C-5B to have performance capabilities equal to or better than its predecessor. Particularly noteworthy was a lessened take-off distance coupled with increased payload capability.

Incorporating all the technological improvements made over the last thirteen or so years, the B model contained over 100 improved systems, including the redesigned wing, an improved navigation system, and new radar and engines. (The TF39-1C engines provided an additional 3,500 pounds of thrust over the original TF39-1B models.)

The C-5A benefitted from this as well, as many of these improvements were applied to the older version in modification programs. Furthermore, when ordering spare parts for the C-5A, SA-ALC item managers chose the C-5B upgraded parts as the preferred items, improving the reliability and maintainability of the A model.

The Air Force accepted its first C-5B in December 1985. For the next three-and-a-half years, C-5Bs rolled off the Lockheed production line right on schedule. Finally, in April 1989, MAC Commander-in-Chief General Duane Cassidy, flew C-5B 87-0045, the last B model delivered from the Lockheed-Georgia plant to Dover AFB. The original contract had an estimated price tag of $8 billion, with provisions for increases due to inflation. However, lower than expected inflation and price reductions on certain renegotiated items dropped the final cost to $6.7 billion. Management responsibility for the C-5B program transferred to SA-ALC on March 31, 1989, giving the ALC total responsibility for the entire C-5 fleet.

As the C-5Bs moved into service with the active duty military airlift wings across the country, MAC transferred forty-four A models to Air Force Reserve and Air National Guard units: the 433rd Military Airlift Wing (Air Force Reserves) at Kelly AFB and the 105th Military Airlift Group (New York Air National Guard) at Stewart International Airport, Newburgh, New York, received C-5As in 1986 while the 439th Military Airlift Wing (Air Force Reserve) at Westover AFB, Massachusetts, received C-5As the next year.

A Spectrum of Aircraft Management

In the mid-1960s, SAAMA gained management responsibility for a diverse group of aircraft--trainers like the T-37 "Tweety Bird," T-38 "Talon," and the T-43 "Flying Classroom;" cargo planes such as the C-5 and C-9 "Nightingale;" and combat aircraft like the F-5 "Freedom Fighter," A-37 "Dragonfly," and the OV-10 "Bronco."

The Trainers

On August 2, 1965, in conjunction with the Air Materiel Area Phase-Out Program, the T-37, T-38, and F-5 system and item management work loads transferred to SAAMA from Middletown AMA, Olmsted AFB, Pennsylvania. San Antonio's Directorate of Materiel Management established a new Aircraft and Equipment System Support Management Division to handle the new responsibilities, including those for 412A Life Support Equipment. The first T-37 and T-38 aircraft arrived from Olmsted AFB on August 17, 1965, for engineering prototyping and guidance for future modifications. While these aircraft were new to the San Antonio AMA, they were not new to the Air Force. Cessna began deliveries of the T-37 in 1955, and by April 1961 it was the standard trainer for the Air Force. Also in 1961, Northrop delivered its first super-sonic T-38 to Air Training Command. On January 31, 1972, program

T-37 "Tweety-Bird" - primary jet trainer since 1961.

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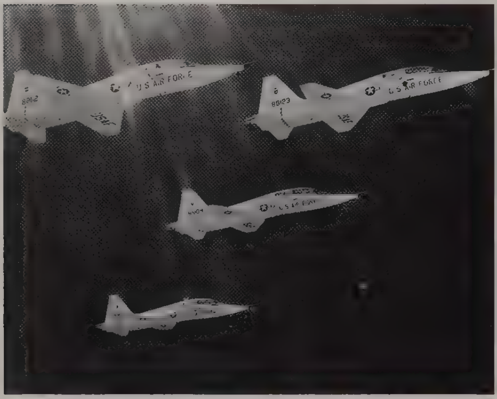
SA-ALC picked up management responsibility for the T-43 navigator trainer in 1971.



PACER CLASSIC was designed to extend the T-38 Talon's useful life into the 21st century.

In addition to responsibility for the C-51, SAAMA also managed the C-9 "Nightingale" Aeromedical Transport.

management responsibility for the "Talon" transferred from Aeronautical Systems Division, Air Force Systems Command, to SAAMA. San Antonio picked up management of another trainer on August 18, 1971, when Headquarters AFLC assigned the T-43 navigator trainer to SAAMA; however, deliveries of Boeing's spacious trainer did not begin until 1973.

Air Force student pilots had been learning to fly T-37 jet trainers for almost thirty years when the Air Force began looking for a replacement for its aging fleet. By 1982, the Air Force had chosen the Fairchild T-46 to replace its T-37s, but schedule delays, manufacturing difficulties, management problems, and congressionally mandated budget cuts plagued development of the new trainer from the start. Finally, in March 1986, Air Force leaders announced their decision to cancel the T-46 program. Instead, they chose to upgrade the existing T-37s. The resulting Structural Life Extension Program, begun in November 1988, would extend the life of the T-37 until the year 2006.

The T-38 also had a program designed to extend its useful service life into the next century. PACER CLASSIC, which began in 1985, consisted of various modifications to ensure the structural integrity of the T-38 and improve its reliability. These modifications affected most of the major systems of the trainer, including airframe, engines, and avionics; but like most programs, completion of the modifications depended heavily on funding. Nevertheless, SA-ALC managers expected both PACER CLASSIC and the Structural Life Extension Program to be completed by the mid-1990s.

Cargo Transports

In addition to responsibility for the giant C-5, SAAMA also managed the C-9 "Nightingale" Aeromedical Transport, which Douglas developed from its DC-9 civil airliner. The first production model rolled out of the factory in June 1968 and deliveries to the 375th Aeromedical Wing at Scott AFB in Illinois began two months later on August 10. The Air Force immediately put the new air evacuation aircraft to use, transporting casualties from the fighting in Vietnam to the West Coast for medical treatment. Program management responsibility transfer for the C-9A from Aeronautical Systems Division to SAAMA took place on February 1, 1970.

Governments not requiring sophisticated air defense systems found the A-37 to their liking. Relatively inexpensive to buy, support and operate, the A-37 proved an ideal close air support aircraft.

Combat Aircraft

American participation in the war in Vietnam and a change in military doctrine emphasizing counter-insurgency operations spawned development of new combat aircraft during the 1960s. One of these was the A-37, an attack version of the T-37 trainer. In 1962, two T-37s were equipped with machine guns, rockets, and practice bombs to determine their suitability for counter-insurgency operations in Vietnam. Success of those tests lead to production of the A-37A, which began arriving at Air Force units in 1966. The new attack aircraft reported for combat in Vietnam on May 2, 1967, and within a year, A-37s had flown 10,000 missions. Deliveries of the A-37B, an advanced version built mainly for the Military Assistance Program, began in 1968. San Antonio, as system support manager for the T-37, also had responsibility for the attack version.

North American-Rockwell International designed the OV-10 specifically for counter-insurgency operations in jungle terrain. Its ruggedness, simplicity of operations, and maneuverability made it a natural for forward air control, observation and reconnaissance, close-air support, and limited ground attack missions. In December 1966, AFLC designated SAAMA as the Bronco's system support manager. Deliveries to Tactical Air Command and Pacific Air Forces units began in 1968. On October 22, 1972, management responsibility for the OV-10 transitioned to SAAMA from Aeronautical Systems Division.

In its more than two decades of service, the OV-10 flew combat missions in Vietnam and performed forward air control missions with the 601st Tactical Control Wing in Germany. Other units flying the OV-10 were stationed in Korea, Alaska, Hawaii, California, and other states. During this time, SA-ALC managed a variety of modification programs, nicknamed PACER BRONCO, to update its avionics and wiring systems. As the Air Force entered the 1990s, its leaders decided to retire the versatile OV-10, beginning in December 1991. Still an excellent aircraft, the Air Force "Broncos" would be offered for foreign military sales.

The F-5 "Freedom Fighter"

The F-5 first flew in 1959 in parallel development with the T-38. Northrop originally developed it as a modern, versatile tactical aircraft for sale on the international market. By April 1964, Air Training Command was using the F-5A to train foreign students. With its outstanding flying qualities throughout the entire flight range, the "Freedom Fighter" did very well on the international market. In February 1965, the United States first sold the F-5 to Iran, South Korea, and Greece. This was followed by F-5 Military Assistance Program deliveries to Spain, Norway, Taiwan, South Vietnam, Israel, Thailand, Canada, the Netherlands, and Ethiopia.

Chosen as a replacement in the international market for fighter aircraft, the F-5E "Tiger II," equipped with laser-guided "smart" bombs, first flew in August 1972. American pilots flew the "Tiger II" to train foreign students in its operation and as "aggressors" at combat training schools.

On October 2, 1974, SA-ALC received full engineering responsibility for all versions of the F-5 "Freedom Fighter" from Systems Command, giving it complete engineering responsibility for the many foreign countries that flew the aircraft. Recognizing Kelly's increased work load in the area of foreign military sales and the Military Assistance Program, on July 1, 1974, SA-ALC officials consolidated all International Logistics Program functions into one International Logistics Program Branch within the Directorate of Materiel Management. On January 1, 1976, the branch formed the nucleus of a new SA-ALC organization, the Directorate of International Logistics. This organization was short lived, however, for in November 1983, it again became a division within the Directorate of Materiel Management.

The F-5 Technical Coordination Group

The F-5 made history in 1978 when the United States revealed its plans for a $4.8 billion jet fighter package for the Middle East, including the first American sales to Egypt, which bought fifty F-5Es for $400 million.

By 1979, the United States' Military Assistance Program had sold or made available over 1,600 F-5s, approximately ninety percent of the entire fleet, to twenty-two different countries. While SA-ALC F-5 managers could support the Air Force's aircraft, they were unable to handle the increased work load of the worldwide fleet. Recognizing these support problems but wanting to provide service to its F-5 customers, Headquarters Air Force established the F-5 Technical Coordination Group on October 1, 1979. San Antonio ALC set up a corresponding group to manage the program.

The United States shipped F-5s to South Vietnam in the early 1970s.

With the group, the Air Force hoped to provide a single point of contact for follow-on technical support for countries with the F-5, and to increase the reliability and maintainability of the fighter through the exchange of non-sensitive technical information. Countries flying the F-5 were encouraged to participate on a cost sharing basis, and by the end of its first year, approximately half of the eligible countries had joined.

Phase out of the F-5

By the mid-1980s, the United States Air Force had only a small fleet of F-5s used in pilot training and as "aggressors" by the tactical air forces. In December 1986, an F-5F crashed due to a failure of the upper cockpit longeron. This accident lead to a January 1987 fleet-wide inspection, which revealed fatigue cracks in three other F-5s. San Antonio engineers developed repair procedures, and the aircraft were fixed. But in December 1987, workers at RAF (Royal Air Force) Kemble in England found fatigue cracks on an F-5E during a phase inspection. Consequently, SA-ALC ordered another survey and reduced the normal interval between these checks from 150 flight-hours to seventy-five hours. These inspections left nine F-5s grounded worldwide for cracks in the upper longeron.

Materiel Management engineers, working with Northrop, developed repair procedures and purchased forty repair kits. However, they were not sure how long the modification would last since the high stress and strains the F-5s experienced in flight caused the aircraft to deteriorate faster than expected. To further complicate matters, maintenance workers at Clark Air Base in the Republic of the Philippines discovered severe corrosion on the lower longeron on both sides of the cockpit during repair work on the upper longeron. Faced with these serious problems, SA-ALC officials recommended the Air Force consider phasing out the F-5s before 1993 , and maybe as early as 1991.

In April 1988, the Air Force decided to phase out the F-5s by the end of fiscal year 1989. As the major commands stopped flying their F-5s, the Air Force offered the aircraft to various countries in "as is" condition; that is the receiving countries became responsible for inspection and repair of the lower longerons as well as other subsequent maintenance.

Air Training Command quit flying its F-5s during the last quarter of fiscal year 1989, the last command to do so, thus ending the aircraft's twenty-five years of illustrious service in the United States Air Force.

Shifting Priorities--Round Two

The downturn in military funding during the 1970s reflected a natural shift in priorities after a war, but it also mirrored the anti-military feeling of the American public. Defense spending (after inflation) decreased by more than twenty percent, leaving huge shortfalls in readiness, sustainability, and force structure. Extremely tight defense budgets lead to a "hollow force" with few spare parts and little ammunition. To fund badly needed force modernization programs, the Air Force opted to buy new aircraft (the F-15 "Eagle" and A-10 "Thunderbolt II" became operational in 1976 followed by the F-16 "Fighting Falcon" in 1978) at the expense of logistical support. But as new weapon systems entered the inventory, the requirement for spares grew. High interest rates, longer acquisition lead times, and shortages of strategic materials eroded buying power even more.

While the United States focused its attention on the war in Vietnam and then consistently underfunded defense, the Soviet Union developed and deployed a steady stream of new, more powerful, and increasingly accurate strategic weapons. This relentless growth of Soviet capabilities eliminated the lead

By 1991, over twenty-seven friendly countries flew the F-5 "Freedom Fighter."

U.S. AIR FORCE

the United States once held. Furthermore, the Soviet Union continued its increasingly aggressive policies, combining efforts with Cuba in Angola and Ethiopia (the Soviets provided arms and financial backing while the Cubans supplied troops) and furnishing arms to clients in South Yemen, Nicaragua, and Vietnam.

After the war in Southeast Asia, the United States sought to rebuild a consensus on the country's proper role in international affairs. While they were no longer willing to serve as the world's "policemen," the American people were not ready to withdraw into isolation. This lead to a reexamination of national security policy late in the 1970s as the public became aware of the threat posed by the Soviet Union's massive military might and more aggressive behavior. The Iranian hostage crisis and the Soviet invasion of Afghanistan and intervention to crush the Solidarity movement in Poland made most Americans receptive to presidential candidate Ronald Reagan's push for patriotism and renewed support for the military. Reagan campaigned on the charge that his predecessors had allowed the Soviet Union to gain a "margin of superiority" and made a firm promise to stop the serious deterioration in American military capabilities. President Reagan entered office on a groundswell of support for his confrontational tone and commitment to reassert American leadership in foreign affairs.

Seeing a significant gap between what American forces might be called upon to do in war and what they actually were capable of doing, President Reagan initiated a long term modernization program, spending $1.1 trillion on defense between fiscal years 1982 and 1985. His administration's strategic modernization program upgraded all three legs of the American strategic triad with procurement of MX "Peacekeeper" intercontinental ballistic missiles (ICBMs), Trident II sea launched ballistic missiles, and B-1B and B-2 bombers. And, as importantly, the program provided improved command, control, communications, and intelligence capabilities for American strategic and tactical forces.

Despite the attention given to strategic forces, conventional forces received even greater funding.

President Ronald Reagan visited Kelly on June 24, 1981.

The global characteristic of American interests and commitments made it imperative for the United States to be able to deploy effective combat forces worldwide. New weapon systems began appearing in increasing numbers. More F-15s and F-16s replaced the F-106s and F-4s which had seen service in Vietnam. Acquisition of additional E-4A "Sentry" aircraft enhanced early warning and command and control capabilities while new EF-111 "Ravens" filled the tactical electronic warfare role. The Air Force retrofitted venerable B-52G and H models with new offensive avionics systems and equipped them with air launched cruise missiles. Airlift came into its own in the 1980s as Air Force leaders saw it had a specific deterrent function in regional conflicts. More C-5Bs, C-141s, KC-10s, KC-135s, and ultimately brand new C-17s would provide the means of quickly projecting American military power anywhere in the world. Improvements seen in this generation of aircraft were primarily technological changes in propulsion, avionics, and radar systems, not airframes. That occurred later in the 1980s with the introduction of stealth technology found in the F-117, B-2, and F-22, the advanced tactical fighter.

Between 1980 and 1983, the top priority was to improve readiness and sustainability of existing forces, which meant air crews flew more often and the stocks of munitions and spares increased. After a decade of neglect, logistics received the funding needed to provide both the initial surge and staying power for combat forces. At the end of fiscal year 1983, Air Force mission capable rates rose twenty percent over those in 1979, and sufficient spares were available to generate three times the number of tactical sorties than in 1980.

The Impact on SA-ALC

This sudden infusion of money and influx of new aircraft, engines, and other Air Force equipment had a dramatic impact at Kelly. San Antonio ALC's funding more than doubled from fiscal year 1979, when its managers handled $7.2 billion, to the $16.49 billion budget of fiscal year 1982. The high water mark came in fiscal year 1984 when SA-ALC's funding topped $17.76 billion. San Antonio's work load increased, too, as mechanics installed new offensive avionics equipment on B-52s; put increasing numbers of B-52s, C-130s, and both models of the C-5 through depot level maintenance; repaired more TF39, T56, F100 engines and modules; and worked on a wide variety of commodity items, including support equipment for the new B-1B bomber. Distribution personnel stocked increased levels of spare parts, equipment, and expendable items used during depot-level repair. Contracting specialists had their hands full ordering much needed material now that funding was plentiful, and materiel managers were busy orchestrating it all.

Reality Sets In

But this doubling of funding could not go on indefinitely. As early as 1984, congressional concerns about the sky-rocketing federal deficit, mounting claims of Reagan Administration overspending on high technology (including the President's hotly debated Strategic Defense Initiative introduced in 1983), and procurement horror stories about $600 coffee pots and $700 spanner wrenches caused enthusiasm for defense to weaken. Reagan's defense recovery program lasted much shorter than most people think; begun with the 1981 budget, it peaked in 1985. In December 1985, Congress passed legislation designed to bring the fast-growing federal debt under control by the early 1990s. The Balanced Budget and Emergency Deficit Control Act of 1985, better know as the Gramm-Rudman-Hollings Act, recognized that increased military spending contributed to the deficit problem. By design, the legislation ensured that if the annual federal budget exceeded the established deficit ceiling by ten billion dollars, federal funds would be sequestered, automatically canceling designated federal appropriations with no regard for their priorities. A disproportionate fifty percent of the total overrun would come out of the defense budget.

By 1988, in the name of helping relieve the federal deficit, the armed forces were deactivating combat units, canceling programs, and reducing strength with cuts that had no relation to actual requirements. As in the 1970s, most of the reductions came from the military's operations and maintenance accounts, which translated to less money for civilian payrolls, flying hours, munitions, spare parts, training, and installation maintenance. But AFLC leaders of the 1980s were determined to do what they could to prevent a repeat of the previous decade's "hollow force." They hoped organizational changes, restructuring, shifts in management philosophy, and a renewed emphasis on quality would enable them to meet the upcoming challenges.

Kelly's Military Units

Kelly has seen hundreds of military units organized over the past seventy-five years. During World War I, newly formed aero squadrons filled the pages of the monthly post returns. This changed to air depot groups during World War II; and since 1945, countless squadrons and groups have come and gone as Kelly's responsibilities changed, increased, or decreased over the years.

Formation of one of Kelly's military organizations was a direct result of the lessons learned during the conflict in Southeast Asia. In the spring of 1965, Air Force Logistics Command sent its first rapid area maintenance team to repair crashed and battle-damaged aircraft in Southeast Asia. Initially civilians manned these teams, but in October 1965, Headquarters Air Force directed AFLC to increase the military presence in the rapid area maintenance teams for operations in combat areas or under combat conditions. A new unit, the combat logistics support squadron, resulted. These teams of military maintenance, supply, and transportation specialists would be ready to respond immediately anywhere in the world.

On December 1, 1967, Headquarters AFLC activated new units at each of its five air materiel areas; San Antonio Air Materiel Area's was the 2954th Combat Logistics Support Squadron. By 1971, the Kelly-based squadron had served at Tan Son Nhut and Bien Hoa Air Bases in South Vietnam and U-Tapao Air Base in Thailand, performing time compliance technical order work on B-52s and providing supply support. During Operation Desert Shield/Desert Storm in 1990 and 1991, men and women of the 2954th deployed again -- this time to Southwest Asia where they repaired battle-damaged B-52s, set up bare-base air freight terminals, and overhauled jet engines.

Since the early 1950's, San Antonio Air Materiel Area's Directorate of Special Weapons managed and repaired the Air Force's nuclear ordnance commodity items; but prior to 1962, the 3079th Aviation Depot Wing at Wright-Patterson AFB in Ohio controlled the weapons located at the two aviation depot squadrons (AVDS), the 3096th AVDS at Travis AFB in California and the 3097th AVDS at Westover AFB in Massachusetts. Personnel at these two sites maintained and stored the weapons. On April 18, 1962, as part of an effort to reduce personnel at the headquarters level, AFLC announced the inactivation of the 3097th; Kelly's Directorate of Special Weapons would pick up its responsibilities on July 1. On that date, SAAMA activated the 39th Logistics Support Group, assigning to it the two logistics support squadrons which provided airlift support (the 7th at Robins AFB, Georgia, and the 19th at Kelly) and the two aviation depot squadrons. The 39th was short-lived, however; on July 1, 1963, SAAMA deactivated the group; the 7th and 19th Logistics Support Squadrons were reassigned to the Military Airlift Transportation Service, and the aviation depot squadrons were assigned directly under the Special Weapons Directorate.

The aviation depot squadrons' work load increased during the 1970s. On February 15, 1970, the 3096th AVDS completed its move from Travis AFB. California, to Nellis AFB, Nevada. Located outside Las Vegas, Nellis had more space for expanded facilities and construction of a new air freight terminal needed by the 3096th. On July 1, 1971, AFLC activated a new AVDS, the 3098th, at Kirtland AFB, New Mexico. This was part of an overall reorganization of nuclear responsibilities which came about as a result of the redesignation of the Defense Atomic Support Agency to the Defense Nuclear Agency. Two years later, on September 1, 1973, the 3097th AVDS completed its move from Westover to Barksdale AFB, Louisiana, with the phase down of Westover. The 3097th remained at Barksdale until October 1, 1988, when the unit was inactivated and its responsibilities assumed by the other two aviation depot squadrons.

In 1975, Ogden Air Logistics Center, Hill AFB, Utah, had two units, Detachments 66 and 67, located at the Lackland Training Annex (also known as Medina Base) to store, maintain, and load standard air munitions packages and standard tank, rack, adapter, and pylon packages (STAMP/STRAPP). On November 15, 1975, responsibility for these two detachments merged together to form Detachment 40. After six months of extensive preparation and training, the new unit was declared operationally ready to deploy its munitions and associated paraphernalia. During Operation Desert Shield/Desert Storm, Detachment 40 shipped over seventeen million pounds of munitions to Southwest Asia.

When General Alfred Hansen assumed command of AFLC in the summer of 1987, he pushed for consistency in organizational structure -- consistency both within the command and with the rest of the Air Force. This push, coupled with the desire to enhance AFLC's military structure, prompted the activation of several new squadrons at each ALC during 1988.

General Hansen first turned to AFLC's flight operations, reorganizing the flight test branches into test squadrons. On January 15, 1988, Headquarters AFLC designated and activated the 2873d Test Squadron on May 1. The new organization continued to provide billeting, food service, and housing supply support to the base. On July 1, the 2851st Civil Engineering Squadron was activated in preparation to absorb gradually the work loads, equipment, and personnel from the San Antonio Real Property Maintenance Agency, which was deactivated October 1, 1989. The final squadron to be activated at Kelly was the 2893d Distribution Squadron, which, on November 15, 1988, brought all supply, transportation, and munitions military personnel into one military organization.

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Kelly Air Force Base's 2851st Security Police Squadron won the Air Force Outstanding Security Police Award (Medium Unit) for the year 1987.

Members of the 2954th Combat Logistics Support Squadron practice aircraft battle-damaged repair.

DESERT STORM
OUR TROOPS

CHAPTER EIGHT

TOWARD A NEW BEGINNING

For forty-five years after the end of World War II, American military and foreign policy was built around the concept of containment, strategies which aimed at blocking Soviet expansion around the globe. Foremost among the various strategies developed to carry out containment was that of nuclear deterrence, built upon the American strategic triad of bombers, ground-based intercontinental ballistic missiles, and Navy ballistic missile submarines. At the same time, the military prepared itself to fight conventional actions as well, developing the weapons and strategies needed to conduct operations in defense of American interests around the world.

The Air Force was a vital element in American planning. Two-thirds of the nuclear triad fell under Air Force operational control, and the Air Force provided, along with the Navy, the surest means to project American power rapidly throughout the world. Developing both nuclear and conventional capability was a difficult job for the entire military, but it was a particularly acute problem for the Air Force, which had to balance the needs of both strategic and conventional combat forces as well as maintain the airlift capability required to move ground units wherever they had to be as rapidly as possible. The need to carry out such diverse missions on such a vast geographic scale not only created problems in terms of strategy, but also demanded a variety of different weapon systems and support structures which could keep those systems operating around the world.

In 1981, the Air Force recognized the need to develop a comprehensive framework for logistics planning and published the first "Logistics Long-Range Planning Guide." Updated annually, this guide provided broad planning goals rather than specific proposals, but it emphasized the crucial role logistics played in military planning and the need for planners to develop a logistics system capable of supporting widely varying levels of conflict under a variety of circumstances. In general, though, the premise that the main enemy would be the Soviet Union remained. Through the first half of the 1980s, increased defense budgets allowed Air Force logisticians to rebuild stocks of parts and add new systems to the inventory.

Then, beginning in 1989, a stunning series of political changes began to rock the world, forcing American leaders to cope with a dramatically different set of strategic questions. Soviet control over Eastern Europe unraveled with stunning rapidity. Germany, divided since 1945, moved toward reunification with shocking swiftness, while within the Soviet Union independence movements in the individual republics, coupled with crushing economic problems everywhere in the country, suggested that the Soviet state might soon cease to exist in its familiar form. At the same time, American economic dilemmas, particularly the burden of a growing budget deficit, forced U. S. military and political leaders to implement spending cutbacks and look for ways to increase efficiency at a lower cost. Even the events which led to Operation Desert Shield and Operation Desert Storm, while indicating that the need to project American military strength still existed, could not halt the move toward a smaller, less expensive defense structure. The Cold War was apparently over.

Kelly gets a piece of the Berlin Wall.

Kelly Defends Freedom

For almost seventy-five years the men and women of Kelly Air Force Base have answered their country's call in defense of the basic liberties we all hold dear. When in 1948, the Soviet Union closed off all rail and road traffic into Berlin, the Western Allies rose to the challenge by beginning an around-the-clock airlift of supplies into the encircled city. For fifteen months, cargo airlift flew in a steady stream, and Kelly's workshops, working twenty-four hour shifts, repaired the R2000 engines of the C-54--workhorse of "Operation Vittles"--while supply and support personnel provided some 15,000 items of critical equipment.

Some twelve years after the successful end of the Berlin Airlift, the city once again became the focus of the world's attention. During the night of 12 August 1961, the Soviet-backed East German government erected a wall to divide Berlin, precipitating a Cold War crisis that threatened to erupt into war. Once again, Kelly's people responded, providing vital logistical support during the largest deployment of American aircraft to Europe since the end of World War II.

For over twenty-eight years, the Berlin Wall loomed as a symbol of a divided Europe and divided world. For a generation, the United States, at immense cost, stood steadfast alongside our allies. In 1989, with striking suddeness, the unthinkable happened. The wall came tumbling down.

For the people of Kelly's organizations--the San Antonio Air Logistics Center and Electronic Security Command--the collapse of the Berlin Wall signified a triumph of unparalleled dimension and the culmination of nearly thirty years of dedicated service in the defense of freedom and democracy for all people around the world.

A C-54 flies over a crowd of awaiting Berliners. By the end of "Operation Vittles" American and Allied flyers had delivered over 2,300,000 tons of food, medicine, coal and other supplies.

PACER STRIDE

Shrinking budgets and the apparent elimination of the threat which had dictated the posture of American defense for nearly two generations meant that all the services would have to grapple with a new set of dilemmas and discover new ways of doing things. Certainly, those Air Force commands most directly concerned with acquisition and logistics support would have to develop some way of doing the same job with fewer resources. Shortly after taking command of AFLC in August 1987, General Alfred G. Hansen toured the various ALCs, and came away disturbed by the lack of uniformity among the ways the different centers organized their management operations. Determined to tighten control and have uniformity in the way system program managers (SPMs) did things, General Hansen ordered each ALC to form themselves around three basic SPM models. At the same time, he supported efforts to integrate the complete spectrum of support activities under the SPM for each system. Known as Integrated Weapon System Management, this plan gave the SPM control over everything from contracting, through materiel management and maintenance, to budgeting, warehousing, and transportation.

Each center was initially allowed to go ahead on its own in setting up this arrangement, but in May 1988, General Hansen decided the program needed centralized direction and halted all organizational changes until they could all be consolidated under the single code name PACER STRIDE--with STRIDE actually an acronym for System Program Management: Technology Infusion, Reorganization Initiatives, Integrated Planning, Development and Acquisition, and Engineering Management. Over the summer, a working group at AFLC headquarters redefined the objectives of the program, and in August General Hansen decided that engineers would be assigned to the SPM and contracting personnel would physically be collocated with the SPM's team.

Final touches were put on the program in early October and officials at Kelly met soon afterward to plan local implementation. San Antonio planners proposed to carry out PACER STRIDE in two phases. Unlike the other ALCs, San Antonio had to deal with severe limitations in terms of facilities. Most local managers were in building 171, a converted warehouse which was already overcrowded. Squeezing in additional specialists and shifting offices around without totally disrupting daily support

Personnel
171

Under PACER STRIDE, squeezing in additional specialists and shifting offices in building 171 in order to collocate personnel (buyers with program managers, item managers and contracting personnel), proved to be a complicated task.

in the process required a complicated series of steps. Local officials wanted to collocate personnel from the Directorates of Materiel Management and Contracting and Manufacturing during the first phase, simultaneously restructuring the Directorate of Materiel Management. Phase II would collocate buyers with program managers, item managers, and contracting personnel.

The Kelly officials who planned PACER STRIDE initially expected to complete Phase I by April 1989 and Phase II, which would get started as soon as Phase I was complete, by April 1990. But in January 1989, Air Force Logistics Command headquarters announced that no funding was available to support PACER STRIDE implementation. This news forced officials to scale back much of their planning, especially the proposed changes scheduled for Phase II, but during February and March members of the affected directorates spent harried and hectic days trying to get the Phase I changes complete by the beginning of April. It took a few extra days to finish, but on April 12 the move was finished.

Despite the lack of adequate funding for San Antonio's Phase II PACER STRIDE moves, the Center went forward with planning, hoping to find a way to accomplish the most important aspects of Phase II as cheaply as possible. The use of forklifts from the Directorate of Distribution, for example, avoided the need to use a private moving firm and was one way costs were kept down.

Shortly after the first groups of personnel completed moving to their new quarters in early June 1989, major problems popped up. Installation of computer network and telephone cables promptly overloaded the ancient wiring in building 171--a 1940s era warehouse, converted to office space. Then, as installers laid new cables in the building, asbestos tiles were found. The need to remove them delayed things further. Then, just as workers put the finishing touches on the Phase II effort, events at the Pentagon shook things up once more.

Defense Management Review

In February 1989, shortly after taking office, President George Bush asked the Department of Defense to develop a plan to implement recommended changes in the acquisition process, and improve overall defense management. The result was a "Defense Management Report to the President," issued by Secretary of Defense Richard Cheney in July 1989 that substantially altered the procurement process and laid out the foundation for a series of sweeping changes throughout the entire American military. The report was soon better known by the acronym DMR, for defense management report. (Later, DMR was more often used to stand for defense management review, after the process it started.)

While it was clear from the start that many organizational changes would take time to implement, it was also clear that the earliest focus of managerial change would be in the areas of procurement, distribution, and maintenance operations, all of which would have an impact on the way the San Antonio Air Logistics Center carried out its missions.

To some extent, the Air Force anticipated the coming DMR with a "No Value Added" review ordered by Air Force Chief of Staff General Larry Welch in June 1989. All Air Force Logistics Command organizations were asked to study their activities and eliminate those which did not directly contribute to accomplishing their mission. Two months later, with the DMR process underway, General Hansen ordered AFLC organizations to review all their activities and organizations in an effort to streamline command-and-control and improve efficiency.

During the fall of 1989, the Office of the Secretary of Defense Comptroller began issuing proposals called DMR Decisions (DMRD), each of which suggested specific changes in various military organizations. By early November there were over twenty of these decisions, each linked to substantial cost savings, and many of which applied directly to AFLC organizations and operations. They had an immediate impact on reorganization plans at San Antonio.

At the end of September, San Antonio Air Logistics Center Commander, Major General Richard D. Smith, halted remaining PACER STRIDE activity until clearer direction arrived from Air Force Logistics Command headquarters. One issue which quickly dominated the thoughts of officials at San Antonio was a proposal to combine Air Force Logistics Command with Air Force Systems Command under Defense Management Review Decision Number 943.

An Open Letter to the Work Force from

General Charles C. McDonald, HQ AFLC Commander

With the announcements of additional Defense Management Review details last week, we can proceed with a roadmap for the Air Force Logistics Command of the future.

The DMR has resulted in a thorough review of our organizational structure--in greater detail than other reviews of previous years. The DMR's goal is to improve the way Department of Defense does business, specifically with more efficiency, more accountability, fewer people and at less cost. Change is necessary to accomplish the DMR goals.

Before discussing DMR, a brief word about another item I know is of great concern to you. Earlier in the current fiscal year we faced severe budget problems, particularly relating to the civilian payroll. A hiring freeze and release of some temporary employees in the command were necessary.

This was done in order to help deal with the budget shortages. I believe we will be able to manage the payroll without significant personnel turbulence for the remainder of the fiscal year.

Regarding DMR, the decision to merge Air Force Logistics Command and the Systems Command has been deferred by Secretary of the Air Force Donald Rice. He has put his confidence in our ability to streamline the day-to-day business and realign command operations over the next five years to help Department of Defense meet its goal of saving $39 billion.

Within AFLC, we intend to cut redundant levels of management, consolidate similar functions, and improve work flow. Specific details of Headquarters AFLC, ALC and other AFLC unit restructuring are still under study, and will be implemented incrementally in a measured, sensible fashion.

There will be a gradual work force drawdown in the command over the next five years by about 7,400 persons, military and civilian, as a direct result of the DMR. About 680 will come out of AFLC Headquarters and other Wright-Patterson-based AFLC units, and from 1,150 to 1,500 at each air logistics center. You've read the specific numbers, by location, in your base newspaper. I'm confident that these reductions can be handled through normal attrition, civilian hiring and promotion freezes and perhaps an early retirement program, where needed. This drawdown will result in a different way of doing business.

We need to become a smarter, more efficient, more quality-oriented operation. As we proceed, QP-4 will become even more crucial to our success. It means accepting more responsibility and accountability at the worker level for quality at the front end of each process. It also means we need additional enlightened leadership from the ALC shop floors to the hallways in headquarters which allows workers to do their very best. Our best decisions are made when we have input from all levels.

I realize that change means uncertainty which can be very discomforting. But I view the process as good for the command and its people. I'm optimistic about the future. My concern has been and will continue to be our people. Without people we can do nothing.

Let me repeat; it is my goal to avoid reduction-in-force actions that separate our people from the Air Force. I appreciate the concerns of all our AFLC employees. Let's work together to develop the innovative, efficient, and cost effective ways we will need to meet new and continuing challenges of our AFLC mission--providing combat strength to the operational commands.

The Merger Issue Debated

The possibility of recombining the two Air Force commands most concerned with acquisition and management surfaced early in the Defense Management Review process. It was not an entirely new issue; the two commands had been part of a single organization until the 1950s, and suggestions that they be recombined had sometimes appeared during the following decades.

Under the press of DMR, a new study team looked at the question anew in mid-1989, concluding that a merger did offer some benefits, particularly in terms of providing unified management of weapon systems from the beginning of the acquisition process to the time they left the inventory. On the other hand, the group also concluded that the missions of the two commands were decidedly different. The commander of AFLC, General Alfred Hansen, openly opposed combining the two commands, arguing that they had completely divergent missions; Air Force Systems Command (AFSC) was concerned with research, development and acquisition while AFLC dealt with supply and maintenance. In his view, one or the other of these two areas, each of which was vitally important, would suffer if the two commands were merged into a single entity. Moreover, combining them was not necessary to fulfill the purpose of the DMR. Under General Hansen's direction, AFLC already was emphasizing quality and efficiency. What he proposed in September 1989, in lieu of a merger, was a major restructuring of AFLC, seeking economies and streamlining the command's organization.

The Product Directorate Concept

The organizational structure around which General Hansen wished to remodel the air logistics centers was referred to initially as the "company concept," a term which was replaced within a few months by the term "product directorate concept." Basically, it pushed the underlying premises of PACER STRIDE to their ultimate conclusion, while simultaneously making a sharp break away from the traditional organizational parameters. Organizationally, air logistics centers were built around functions such as maintenance, management, or distribution. No single organization controlled a weapon system completely. An engine manager, for example, depended upon contracting experts to buy necessary parts, maintenance specialists for repair, and distribution workers to store and ship engines in and out of the center. Everyone was working toward the same end--keeping the number of engines in the field as high as possible--but each group worked for a different organizational entity. Problems which emerged had to be solved by temporarily bringing members of these different organizations together in what was called a "Tiger Team." By the end of the 1980s, a number of such teams might exist at any time, and officials who studied this situation readily recognized that this indicated that the organizational divisions were causing operational inefficiencies.

The "company concept" promoted by General Hansen rearranged things around products rather than functions. Changing the term to "product directorate concept" did not change this fundamental premise, it simply avoided the semantic link to private enterprise. Whatever the name, under the concept, the manager of a system controlled almost everything which affected his program--maintenance, supply, contracting, finance, and management. Under PACER STRIDE, workers in some of these different areas shared office space, but under the product directorate concept they would be part of the same organization.

Keeping pace with changing technology was a constant challenge for Kelly's work force.

The Life Support Equipment Investigation Laboratory

Tucked into a small building very close to the railroad tracks that once delineated the southern boundary of Kelly Number 1 was one of Kelly's least known organizations. The Life Support Equipment Investigation Laboratory was not only small, it was unique. No other organization like it existed anywhere in the world.

The foundation of the laboratory was laid in the mid-1970s with the consolidation of all management for life support equipment at San Antonio. Lacking anyone at Kelly with the expertise to investigate possible failures of the F-4 ejection system, the then life support equipment manager persuaded British engineer Michael Grost to come to San Antonio. An engineer with Martin-Bates Aircraft, Limited, Mr. Grost had been working under contract with Pacific Air Forces since the end of the 1960s.

At Kelly, still working under contract, Mr. Grost initially concentrated on F-4 systems, but was soon handling investigations of other systems as well. In March 1983, a small lab was set up in a single room of building 183. Over the following eight years, the lab slowly expanded as its role, if not its staff, grew.

By the end of the 1980s, the lab had supported over 150 accident investigations. Using knowledge from such diverse fields as engineering, physiology, chemistry, and physics, the lab is able, through patient analysis and deductive logic, to reach a clear understanding of what led to the accident, and even the body position and physical actions taken by the pilot. The lab trains all Air Force life support officers, life support superintendents, and egress supervisors and instructs Air Force physiological training officers, flight surgeons, and aviation pyschologists. Special training courses are run for foreign students and accident investigators from allied countries.

In recent years, both the Canadian and Israeli air forces restructured their accident investigation facilities after examining the lab. And, in recent years, the lab has analyzed crash sites in Southeast Asia, helping determine the status of airmen listed as Missing-in-Action during the Vietnam War. Small, almost unknown even within the Kelly community, the lab earned an unrivaled record as one of the crucial elements of the Air Force accident investigation system.

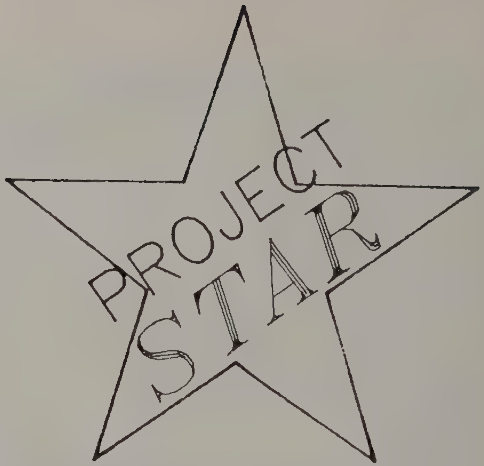
Heightening Tension Within the Work Force

By this time, several years of increasingly tight budgets, coupled with the proliferation of reorganization programs and management reviews which began in 1988 and 1989, spawned any number of rumors among the SA-ALC work force. Even though the center added employees at the end of 1989, news releases about impending personnel reductions and a widely announced early retirement program, simply added grist to the rumor mill. On top of this came the announcement in May 1990 that San Antonio would restructure into the product directorate concept by October. In some work areas, employees were near panic.

Center officials were well aware of this situation, and in August of 1990, General Smith held a series of briefings on the ALC restructuring for supervisors from throughout the ALC. Speaking directly, General Smith candidly admitted that tight budgets and force level reductions already proposed by the Air Force would force Kelly to shrink, too. But, he took pains to reassure his audience that, so far as he knew, this would not involve the involuntary termination of full-time employees. Although no one could predict the future with perfect certainty, it seemed most likely that normal attrition would absorb the vast majority of personnel cuts. On the other hand, as General Smith was equally candid in pointing out, the story might be different in a year or two.

Reorganization and Restructuring

General Smith's remarks probably did not stop further rumors from circulating around the center, but in the meantime planning for the implementation of the product directorate concept moved into high gear. At Kelly, planning for this restructuring was carried out under the code name PROJECT STAR--an acronym standing for Streamlining/Transitioning of ALC Resources, and General Smith took the step of outlining the main features of the plan in a letter to all managers and supervisors.



PROJECT STAR was the code name for local product directorate reorganization activities.

After thoroughly investigating the way successful businesses did things, General Smith pointed out, AFLC identified the common elements shared by those businesses and deliberately set out to incorporate and apply similar procedures. Among these were the need to combine functions and avoid duplication of effort; eliminate tasks which did not further the mission of the center; improve communication, both within the center and between San Antonio and its customers; integrate similar functions into a single organizational entity; and increase worker involvement in the activities of the ALC to increase pride and morale. The QP4 quality program, now metamorphased into a Department of Defense quality effort called TQM (for Total Quality Management) was an important aspect of this, since it offered a series of analytical methods to evaluate the way things were being done and identify those parts of the process needing change. In short, at the same time that the Defense Department was orchestrating change via the DMR, AFLC proposed nothing less than a complete overhaul of its operations in the biggest series of wholesale organizational changes since the 1940s.

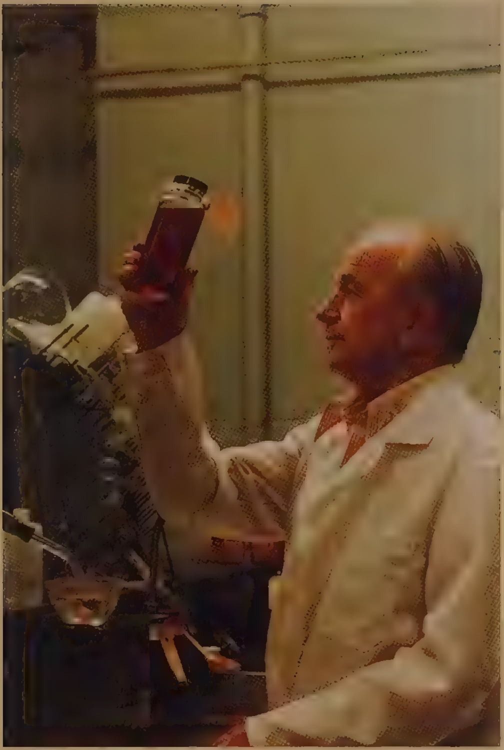
The confusion and stress of PACER STRIDE was soon dwarfed by the hectic effort underway throughout the SA-ALC by the late summer of 1990 as the the former Directorates of Maintenance, Materiel Management, and Plans and Programs spun into a series of completely new organizations. Many small staff offices escaped wholesale change, as did the center's two unique directorates--Aerospace Fuels and Special Weapons. The specialized tasks handled by these two organizations easily dovetailed with the activities in other organizations, but, after some discussion, they continued as independent entities. However, the other large directorates essentially vanished in their familiar forms, and in most cases this involved the movement of large numbers of people.

On the Road Again...

San Antonio Air Logistics Center's unique Directorate of Aerospace Fuels managed all aircraft, missile, and ground fuels for the Air Force and the National Aeronautics and Space Administration, including the propellants and chemicals used in space launches from both Vandenberg Air Force Base in California and Cape Canaveral in Florida. Many of these propellants and chemicals were classified as hazardous, requiring exemptions to federal and state laws prohibiting the transportation of hazardous materials over public highways. Despite the lethality of the cargo, Aerospace Fuels officials were proud of their record of managing over twenty-five years of shipments with no accidental release of toxic material.

Nevertheless, heightened public concern in the 1980s over the shipment of hazardous materials on the highways led to tighter restrictions, especially in environmentally conscious California. In 1984, the California Highway Patrol began dictating which routes trucks carrying hazardous cargo in California could follow. Two years later, as requirements to granting the necessary exemptions, the Department of Transportation began regular reviews of the routes traveled to ensure they avoided congested population centers and asked the Department of Defense to develop emergency response plans in case of accidents.

The issue resurfaced in 1987 as a California congressman held hearings in Los Angeles on transporting hazardous materials on public highways. In the midst of the negative publicity generated by these hearings, Mayor Tom Bradley demanded the Defense Department reroute any shipments of toxic chemicals around the southern California metropolis. Department of Transportation officials insisted Aerospace Fuels personnel find alternative routes to Vandenberg, temporarily halting any further propellant shipments.


Aerospace Fuels labs around the world constantly tested Air Force fuel to ensure their quality.

A new route was certified in early 1988, but that only solved part of the problem. Directorate transportation specialists still had to develop an emergency response plan, with a full-time escort team, before Transportation officials would renew the expired exemptions. Developing the plan proved easier than finding a suitable escort team. Initially, directorate personnel negotiated with the Army Technical Escort Unit, but differences of opinion on what constituted a suitable vehicle closed that option. Finally, SA-ALC contracted with a commercial firm to provide emergency response escort services. The contractor team successfully escorted its first shipment in February 1989. Funding for this multi-million dollar contract came from the fuels stock fund. It was clear to everyone that the cost of "doing business" would continue to climb.

Kelly AFB's new industrial wastewater treatment plant

Environmental Management

In 1975, the Department of Defense began a program to identify environmental hazards created by the disposal of chemicals, solvents, or other waste on military installations. Known as the Installation Restoration Program, it reflected the growing awareness of environmental issues throughout the country. When Congress passed the Comprehensive Environmental Response Compensation and Liability Act in 1980, an act which was intended to pay for cleaning up waste disposal sites nation-wide (and which was better known as the "Superfund"), the military clean-up effort was already well underway.

Despite a long history of solvent and chemical use, Kelly's environmental problems were comparatively mild. Nevertheless, some areas of the base, notably the site of the "Green Worm" engine cleaning line, demanded attention. The same was true of other Air Force Logistics Command bases, and in 1986 General Earl O'Loughlin, Commander of Air Force Logistics Command, instructed all the air logistics centers to form an office to coordinate environmental issues. The Environmental Management Office at Kelly was in existence by that fall, and by 1987 it held responsibility both for developing environmental protection policies and for seeing to it that those policies were carried out.

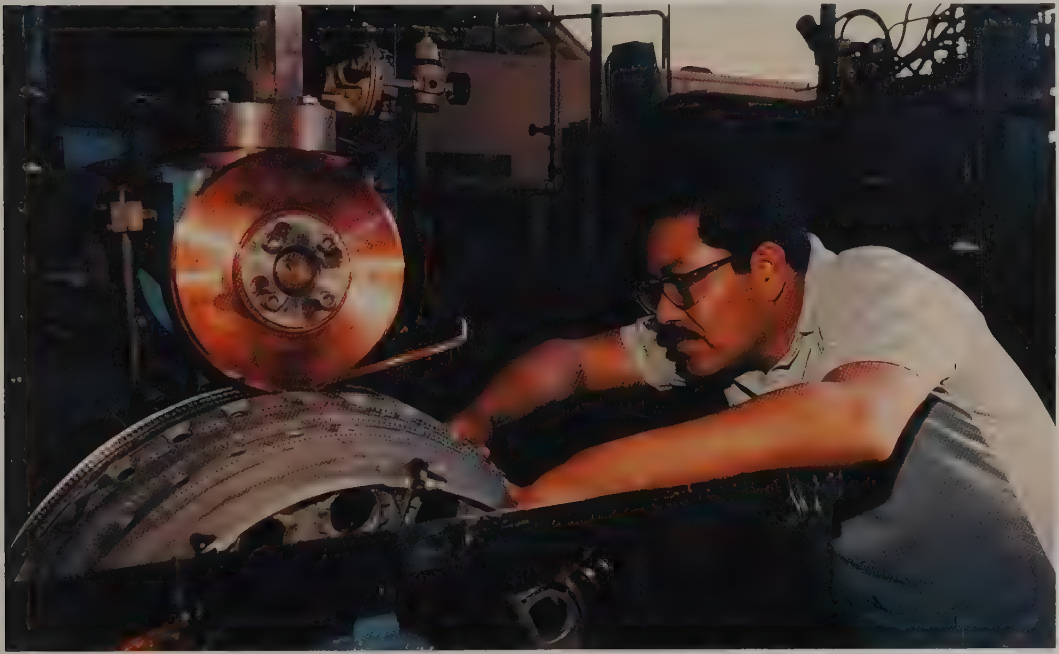
This was a tall order. Kelly generated about forty-three million gallons of liquid industrial waste annually in the late 1980s, along with around six million pounds of solid waste. Approximately forty percent of this waste was classified as hazardous. Storing and disposing of it required constant monitoring, and the issue of storage created an intense community debate. At the same time, Kelly took steps to avoid future problems through the construction of a new, larger, and more efficient wastewater treatment plant, and through the inaugeration of efforts to find non-hazardous substitutes for the chemical solvents and cleansers that were regularly used in aircraft maintenance. In an era of growing awareness that national resources had to be protected, these were only the first steps on a long, but necessary, journey.

Although all the moving was not quite finished, the new organizational structure became effective on October 1, 1990. A new Propulsion Directorate handled all aspects of engine management and repair, for example, while the Aircraft Directorate did the same for aircraft. The Directorate of Plans and Programs vanished, combining with the Comptroller's office to become the Financial Management Directorate, with a mission broadly defined to include planning as well as budgeting. Contracting and Manufacturing personnel, specialists in procurement, were matrixed into these new organizations, shrinking that directorate into a much smaller Directorate of Contracting. Two new directorates appeared--a Aerospace Equipment Directorate, which handled test and support equipment, and a Directorate of Technology and Industrial Support to control the engineering and scientific support for the other organizations. At the same time, the Directorate of Communications and Computer Systems merged with the 1923rd Communications Group to form a single communications and computer organization at Kelly. In this case, though, the smaller fish partially swallowed the larger, and the former directorate formally became the Headquarters 1923rd Communications and Computer Systems Group.

All these changes were accompanied by hundreds of people moving to new desks or new buildings, with new phone numbers and new co-workers. For weeks after the first of October personnel at the center had to consciously think about the new names attached to groups they once knew, and it was some time before all the phone and computer lines were in place for the new organizations. Moreover, Kelly personnel had little time to catch their breath despite the magnitude of the changes they had just gone through. More changes were coming.

The Continuing Impact of the DMR

The restructuring of Air Force Logistics Command did not, as some supporters of the effort undoubtedly hoped, forestall the consolidation of the command with Air Force Systems Command. In January 1991, Secretary of the Air Force Donald Rice announced that the two commands would merge into a single Air Force Materiel Command around mid-1992. In a message to the AFLC work force, new AFLC commander General Charles C. McDonald "enthusiastically support[ed] this decision," stating that it presented an opportunity to



Under the new product directorate concept, the manager of the system controlled almost everything that affected his program - maintenance, contracting, finance and management.

further improve customer support and integrate improvements in technology more rapidly. By mid-April 1991, a provisional command headquarters existed at Wright-Patterson Air Force Base and planners had settled on the basic organizational arrangement of the new command. Appropriately, its emblem would be the old Air Materiel Command emblem, a choice which served as a reminder of the heritage shared by both commands as they moved closer to full consolidation.

Integrated Weapon System Management

A key part of the newly consolidated command, the integrated weapon system management concept attempted to meld the responsibilities handled by each of the separate commands into a single "cradle-to-grave" management approach. Under this arrangement, the program manager for a particular system would be the single point of contact for all facets of that system's development, from the earliest phases of design and procurement until it was retired from the inventory. This was exactly the same thinking, of course, which had resulted in the creation of the product directorates at the logistics centers during 1990, and its goal of integrating all phases of weapon system support, from acquisition through logistics support, simply pushed AFLC's reorganization to the next logical step.

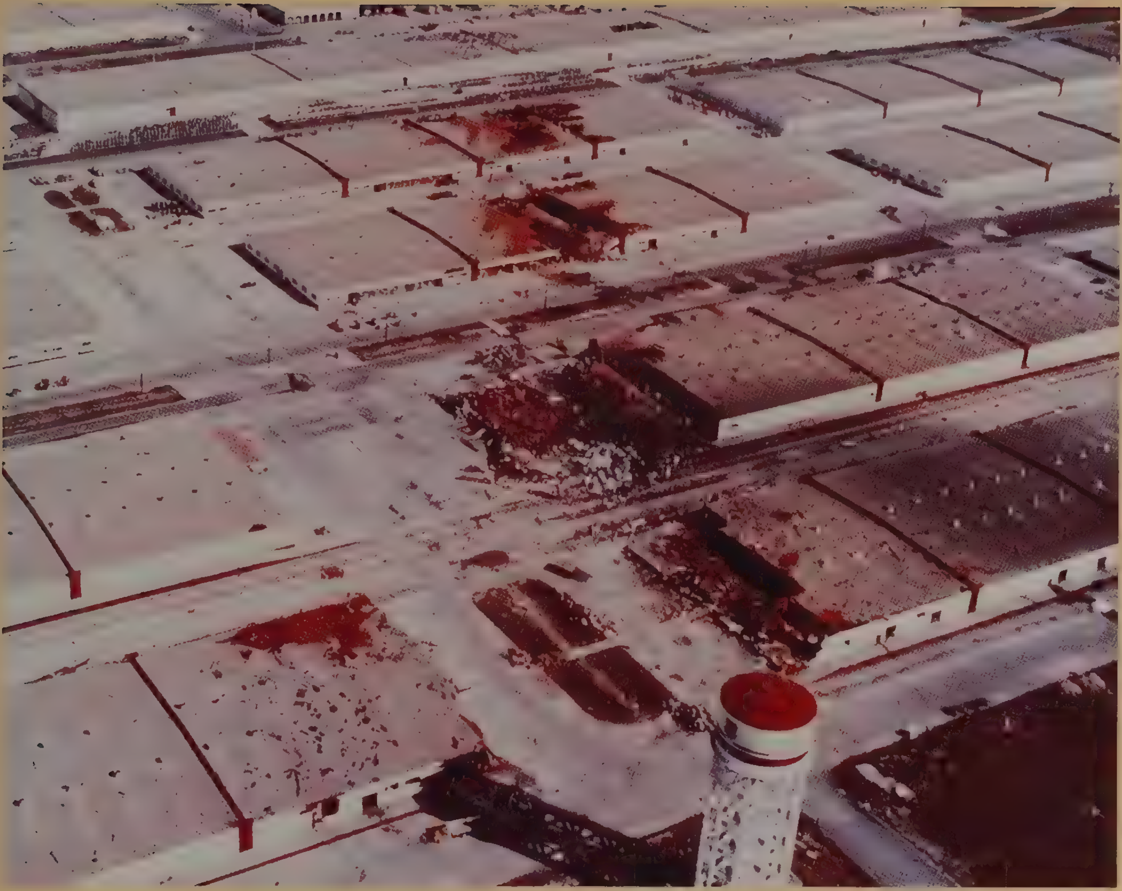
Consolidation of Depot Supply Activities

Under DMRD 902, the Department of Defense proposed to consolidate control over all supply depots under the Defense Logistics Agency, including the Directorate of Distribution at San Antonio. Officials at Kelly found this proposal disturbing on several counts. Over half of the items stocked in its warehouses, for example, were used in maintenance of aircraft and engines. In addition, a hefty proportion of the other items stored were stocked in direct support of base activities. Local officials were concerned that centralization of supply activities would disrupt support to the depot and other Kelly organizations, and actually add to rather than lower costs.

Automated Warehouse System in the Directorate of Distribution.

Planners expected to have a prototype organization established in the San Francisco area by July 1990. Data from the operations of this prototype (which included the distribution and supply organization of the Sacramento Air Logistics Center) would then be used to provide a framework for further consolidation. Some officials at Kelly undoubtedly hoped that this test would vindicate their view that consolidation would create more problems than it solved, but most realized that some form of consolidation was inevitable. By May 1991, San Antonio had negotiated memorandums of agreement with the Defense Logistics Agency and was making plans to transfer part of the distribution and supply operations to it during late 1991. Under these plans, a residual distribution and supply directorate would continue to handle supply for the depot.

Congress, though, forced a delay by including in the fiscal 1992 budget appropriation a demand for a complete analysis of the San Francisco test, especially an evaluation of the links between the different data automation systems used by each of the services. But there was still no question that both the Pentagon and Congress continued to anticipate a consolidation of supply operations. The issue was not if, but when.



Down, But Not Out

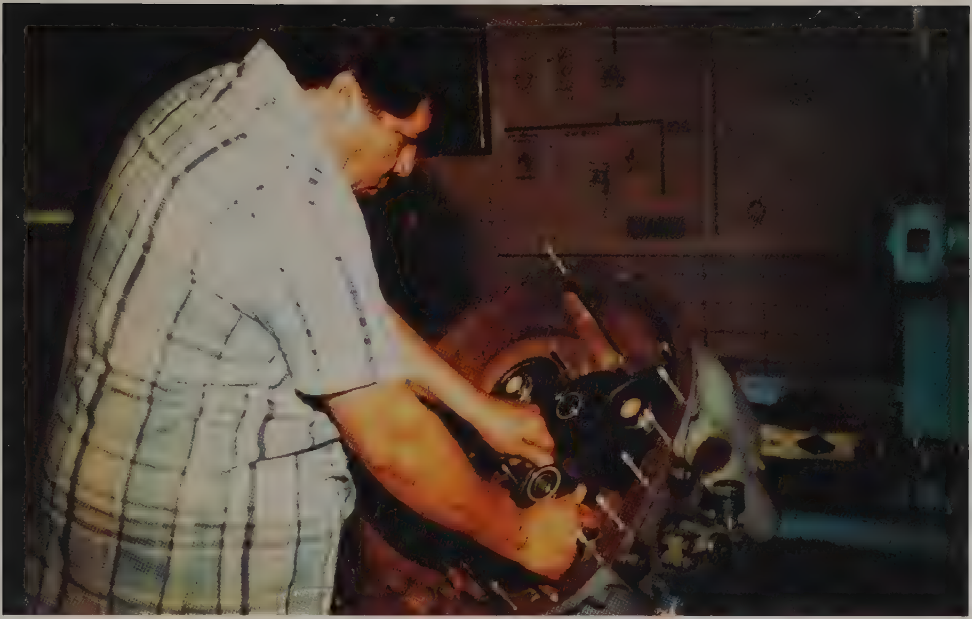
More than once in Kelly's history did the sudden mood changes of "Mother Nature" wreak havoc on base activities. Kelly personnel again were reminded of the power of the elements early on the morning of September 17, 1988, when Hurricane Gilbert struck the Mexican coast 400 miles south of Kelly Air Force Base. As the hurricane moved inland into Texas, it spawned numerous tornadoes, two of which touched down at Kelly. One of these tornadoes was responsible for an estimated $22 million worth of damage to the base.

The first tornado, which caused no damage to the base, was reported at 6:30 a.m. near the south end of the base's runway. The second tornado hop-scotched around the base, narrowly missing Billy Mitchell Village, the base housing area, before touching down and demolishing all or part of twelve buildings within the Directorate of Distribution area. The tornado destroyed an estimated 1.1 million-square-feet of storage space.

Once the threat had passed, the focus shifted from damage assessment to recovery. The Distribution area, hardest hit by the tornado, had to be cleared of debris from the warehouses, packing materials, and crates. As members of the 2954th Combat Logistics Support Squadron from Air Force Logistics Command bases arrived on the scene, they were tasked with the duties of reclamation, transportation, and inventory of all items they were able to collect. They were also responsible for packaging items including wrapping materials and building crates. Additional support arrived in the form of a thirty-nine member team from the 449th Mobility Support Squadron, Holloman AFB, New Mexico, which erected ten "Harvest Bare" portable hangers for the temporary storage of parts and other materials that were left without shelter after the tornado. Members of the Prime Base Emergency Engineering Force (PRIME BEEF) from Wright-Patterson AFB, Ohio, working side-by-side with the SA-ALC PRIME BEEF team, removed the damaged portions of those buildings destroyed by the tornado and made those salvageable buildings safe for contractors who performed the major repair work.

The support and commitment displayed by the members of the SA-ALC, the Air Force Logistics Command, and those units who assisted Kelly AFB during the days, weeks, and even months that followed the tornado were in keeping with the mission orientation of all Air Force people. Only two months after the tornado operations in the Distribution area were up to eighty percent of capacity. Within one year the directorate had almost completely recovered, showing the dedication of the people who work within the directorate.

After months of planning, Pope John Paul II arrived at Kelly on September 13, 1987.



San Antonio's initial candidate for competition was the T56 gearbox.

fact private companies. Success would be measured just as it would for such a company: by profit. And the effort to win competition was expected to force government depots, including the San Antonio Air Logistics Center, to improve the efficiency of their operations, lowering costs in the process.

By the late spring of 1991, it was evident that the projected savings of competition and consolidation would not match the reductions in the defense budget estimated over the forseeable future. At best, the Air Force projected a total savings of some $418 million and needed to find ways to cut another $300 million in costs. Of this, San Antonio's obligation was to find some way to cut a further $71.6 million.

Local officials argued that interservicing and reduced capacity would account for some of this, with the rest being met through competition. This might mean a loss in work load to the center, with corresponding cuts in the work force--an unhappy prospect for both Kelly and the city of San Antonio.

One of the main candidates for competition was the T56 gearbox, a work load previously scheduled for transfer. But others included such long-term mainstays as the TF39 engine (which the Navy claimed it could repair for a cost which SA-ALC officials regarded as unrealistically low), and the T56 engine. Even the C-5, the depot's largest work load,

Boning up on the TF39 engine, powerplant for the mammoth C-5 Galaxy, takes Kelly AFB Maintenance personnel into part identification of gigantic proportions. The huge engine has an intake diameter of more than eight and one-half feet.

was not immune. It was conceivable that a private contractor, such as the manufacturer Lockheed, might take on the overhaul responsibility. There were sixteen or more candidates for competition by April of 1991.

Although Defence Management Review Decision 908 did not forecast the closure of any Air Force depots, the issue surfaced in the fall of 1990 and remained a topic of speculation during 1991. Ten years earlier the notion of closing the San Antonio depot would have been dismissed as nonsense. Now, though, the uncertainty spawned by budget cuts and multiple reorganization efforts meant that the question was likely to be taken seriously. And if the depot closed, what of the base? Would Kelly itself be shut down as was happening to many other installations around the country? No one knew. Kelly's people carried on, but the future of their base was more uncertain than ever before.

Kelly Goes to War

Although sustaining Air Force units around the world in peacetime was the main activity of the San Antonio Air Logistics Center the need to prepare for wartime support was never far from anyone's thoughts. Doing so would mean a dramatic change from peacetime routine, and the demands of wartime emergencies could not be improvised at the last minute. There would be no time to build up a new routine or new organization during an emergency; plans had to be in place, and practiced, ahead of time.

While such exercises, known as Operational Readiness Inspections or ORIs, were familiar aspects of peacetime training for operational units, they were new to Air Force Logistics Command and the air logistics centers. And, at the same time, international events offered a vivid reminder that, even as the Cold War waned, the call for American military action could happen at a moment's notice.

Operational Readiness

By mid-February 1989, the San Antonio Air Logistics Center was already hard at work, preparing for their first Operational Readiness Inspection. Ogden ALC was the first AFLC base to go through an ORI and San Antonio officials studied the results closely. In addition, the local Office of the Inspector General conducted three practices evaluated by the local Readiness Exercise Evaluation Team. All three went well, as did a final practice during the Joint Chiefs of Staff command post exercise WINTEX-CIMEX in February and early March. The exercise dealt with the same areas covered in an ORI: wartime response, mobility deployment and employment, disaster response, and base security.

Less than two weeks later, from March 13 to March 23, 1989, San Antonio went through its own ORI. The results were a bitter disappointment. To keep costs, especially overtime costs, to a minimum, Major General Lewis Curtis, the ALC commander, tried to use functional experts in each directorate as players, allowing most item managers, buyers, and supply specialists to carry on their normal day-to-day activities. Many were essentially unaware that the exercise was taking place, and the limited number of exercise players prevented full-scale operations around the clock. But the AFLC inspectors did not stay in the command center; they visited the directorates where they found workers unaware of exercise requirements that affected their items. The final overall rating for San Antonio was marginal, not the excellent that participants had anticipated.

In another sense, though, this result proved positive. It forced the ALC to reevaluate how it planned to do things under wartime conditions, especially how it would orchestrate its "surge" activity--the accelerated pace demanded under emergency conditions. Indeed, center officials had caught their own mistakes during the ORI and made changes which dramatically increased their effectiveness. Unfortunately, the changes came too late to alter the outcome of the ORI.

When meetings began among officials to assess the results of the Operational Readiness Inspection and make plans for a retake (scheduled for August), they immediately altered the way they would run surge decision-making. Doing this involved reviewing the entire list of potential surge items, developing a computer data base to assist in managing this list, and stressing the need for keeping the people who handled surge items the same ones who dealt with those items daily. To test the new approach, the center practiced three times, in May, June, and July, before the Air Force Logistics Command inspectors returned on August 21.

By mid-February 1989, the San Antonio Air Logistics Center was already hard at work preparing for their first Operational Readiness Inspection.

The Operational Readiness Inspection retake ran from August 21 to August 28, and it was a complete success. Every problem area under the Air Logistics Center's control had been corrected. Surge items were accurately tracked; deadlines met; communication timely and complete. Far more personnel were actively involved in the retake, and their knowledge of what had to be done impressed the inspectors immensely. The final rating was still only a satisfactory, but that was the highest rating possible during a retake, and when they left the inspectors admitted that some of the steps taken by the center were being evaluated for adoption throughout the command. Moreover, this success could not have been timed better. It was not long before Kelly and the Air Logistics Center would get the chance to test their ability to react quickly under even more strenuous circumstances.

Operation Just Cause: The American Intervention in Panama

American relations with the Republic of Panama were based from the start on the Panama Canal, built by the United States during 1904-1914 and long considered one of the most important American military assets. In 1977, however, after several years of patient negotiation, the United States and Panama finally signed a treaty giving Panama control over the canal in 1999. Yet, despite this evidence of amity between the two countries, relations grew steadily worse during the 1980s. Following the death of Panamanian leader General Omar Torrijos Herrera in an aircraft crash, General Manuel Antonio Noriega emerged as the effective ruler of Panama. In early June 1987, popular anger erupted in response to a series of charges levied against Noreiga by his former chief of staff. Demonstrations were met by force, and the violence escalated. Then, on February 4, 1988, General Noreiga and fifteen co-defendants were indicted by federal grand juries in Tampa and Miami, Florida, on charges of drug trafficking. Noreiga responded with a public demand that the United States military leave Panama immediately.

For the next twenty-two months tension slowly increased as American officials tried unsuccessfully to persuade Noreiga to abandon his position. American personnel and Panamanians working for American agencies were harassed almost continuously. At first the American government was reluctant to use force to solve the crisis, largely because of the problems this would create with other Latin American governments. But the failure to negotiate a settlement with Noreiga, together with his own inflammatory rhetoric and the lingering stigma of the Florida drug charges, had pushed American officials toward a military solution by the fall of 1989. Then, in December the crisis abruptly escalated when Noreiga "declared war" on the United States; an American officer was shot and killed by Panamanian troops, and an exchange of gunfire took place between an Army lieutenant and Panamanians. In the early morning hours of December 20, 1989, American paratroopers began landing as other ground forces moved from American bases against Panamanian military strongpoints. In some cases, fighting was severe, but within a day American troops controlled the city, a democratically elected government (kept from taking office by Noreiga in the spring) was in place, and Noreiga had taken refuge in the residence of the Papal representative. Given no other option, Noreiga surrendered to U. S. troops a few days later. Contrary to official fears, the predictable Latin American complaints about the operation were muted.

Kelly's Role in Operation Just Cause

Kelly's senior military leadership learned about the operation around midnight on December 19, about the time that the invasion began. The first priority was to prepare to receive returning wounded, but officials also had to make arrangements for security, refueling transient aircraft, and customs processing for crews and troops coming back from Panama. No specific plan existed to deal with all these issues, and solutions had to be developed rapidly. Adding to the complications was the weather; it was bitterly cold in San Antonio, with the outside temperature hovering below twenty degrees farenheit.

KELLY AIR FORCE BASE

Troops stopped off at Kelly on their way home from Panama.

Despite these handicaps, things came together well. Officials chose the large operations hangar, building 1610, to be the reception center. The building was not well heated, but within a few days tents were up inside the hangar. The temperature inside the shelters was kept up by piping warm air into them from gasoline operated heaters set up outside. Inside the hangar as well was a command post, set up to handle what was locally known as Operation Spur.

Initially told to prepare to refuel nine aircraft, Kelly handled over twice that many within the first twenty-four hours. Food service personnel worked frantically to prepare food for the troops on board, providing fresh box lunches until it became clear that it was simpler to bus the troops to the mess hall while their aircraft was refueled. By mid-morning of the 20th, wounded were arriving, too. Medical personnel quickly established procedures to get them on their way to Wilford Hall, the Air Force medical center on Lackland Air Force Base, or the Brooke Army Medical Center at Fort Sam Houston.

Refueling Operations in Support of Operation Just Cause

The support provided by SA-ALC's Directorate of Distribution's Fuels Management Branch established a new record for aircraft servicing rates in the support of Operation Just Cause. The initial aircraft surge started on December 20, 1989 at 0215 hours continuing through December 27th. During this period 109 C-141's and twenty-eight C-5 aircraft were serviced with a total of 2.0 million gallons of JP-4. This is significant in the fact that the normal monthly consumption rate is only 2.4 million gallons. The fuel support posture at the start of the operation was limited to twelve refueling vehicles and augmented by four Randolph Air Force Base refueling vehicles towards the final stages of the operation. Had the North Ramp Hydrant System been in operation--it was out of commission for add-on construction--fuel support would have been enhanced significantly. The existing fuel servicing rate would have increased from 36,000 gallons per hour to 108,000.

On the peak aircraft servicing day, December 23, 1989, twenty-five C-141's and ten C-5 aircraft were serviced with an average fuel load of 13,400 gallons per C-141 and 25,000 gallons per C-5 aircraft. The twenty-five C-141s that were serviced required an average of three truckloads (4,500 gallons per load) and the C-5's six per aircraft for a total of 135. Because the distance between the aircraft parking ramp and the bulk fuel storage area required an eight mile turnaround, each truck logged an average of ninety miles transporting fuel. For the peak day, 1,100 miles were logged and 4,000 for the entire operation. This signifies the massive effort that was required in supporting the fuel requirements on the peak day. In retrospect, the fuel support for "Just Cause" was a tremendous effort especially in view of the fact that all aircraft refueling was accomplished by truck.

Another factor that was central to mission support was the extensive commercial fuel resupply effort. During one forty-eight hour period, 100 commercial tank trucks were off-loaded into tankage for a total of 890,000 gallons. Throughout the entire operation, 214 were off-loaded for a total of 1.9 million gallons.

Enhancement factors that for the most part were not applied, were the multiple truck aircraft servicing and concurrent refueling options. On the multiple truck option, all C-141's could have accommodated refueling and up-loading or down-loading of aircraft. As it was, refueling vehicles were standing by to refuel while passengers and cargo were processed. Both options were available but not requested. We speculate that aircraft crews were manned to refuel by hydrant where only one crewmember is required to monitor the single point nozzle. This limitation did not allow multiple truck servicings which may have contributed to delays in fuel onloading operations. In addition, more reliable aircraft flow schedule information would have aided in preplanning fuel support measures. In summary, despite "Just Cause" being initiated on a no-notice basis, personnel responded in a highly dedicated manner and provided exceptional support.

By the time Kelly's actions in support of Just Cause ended in February 1990, over 275 aircraft had passed through, carrying some 5,500 personnel and 250 tons of cargo. On the peak day of operations, December 23, 1989, Kelly serviced thirty-five aircraft. Base personnel provided as many as 10,000 meals and dispensed over two million gallons of jet fuel along with 11,000 gallons of ground fuels. Medical personnel processed 268 casualties through the temporary facilities in the operations hangar, coping with temperatures that fell to near zero at one point. By any measure, Kelly's efforts on behalf of Just Cause were an outstanding success.

A recently-arrived C-5 from Panama is refueled and readied for its continuing trip home.

Tents set up in building 1610 received heat from temporary gasoline-operated heaters.

Surging C-5s for Operation Desert Shield/Desert Storm

War in the Desert:

Operation Desert Shield/Desert Storm

The San Antonio Air Logistics Center was already well into PACER STRIDE by the time Just Cause ended, with further reorganizations triggered by the DMR on the way. The attention of center personnel was naturally on the internal changes being wrought by these reorganizations and the foreseeable impact of budget cuts and force level reductions coming as a result of the political shifts in Eastern Europe. Then, on August 2, 1990, Iraq invaded the small Persian Gulf kingdom of Kuwait, and the San Antonio Air Logistics Center found itself abruptly at war once again.

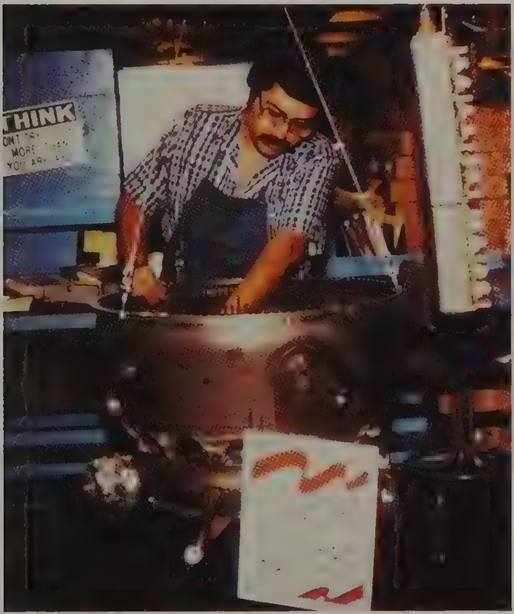
In an unprecedented step, the Kingdom of Saudi Arabia agreed to allow foreign forces on its soil; and, on August 7, President George Bush ordered American forces to the Gulf. Their initial purpose was to defend Saudi Arabia from what appeared to be the imminent threat of invasion, and, aptly, the code name for the deployment was Desert Shield. The United Nations voted to impose economic sanctions on Iraq on August 6; and over the next few days Middle Eastern and European nations joined the growing military coalition. On August 22, President Bush authorized the first call-up of reservists to bolster the American presence in the Gulf, and three days later the United Nations voted to authorize the use of force to enforce its resolutions.

The flow of men and material into Saudi Arabia went on non-stop, with volunteers from reserve units flying missions in support of active duty and activated reserve units. On August 28, a C-5 flown by volunteers from the 433rd Military Airlift Wing, based at Kelly, crashed on takeoff from Ramstein Air Base, Germany. Ten of the seventeen people on board were members of the 433rd, and nine died in the crash. News of these fatalities brought the reality of this new war home to everyone in San Antonio.

The Build-Up

On August 9, 1990, the San Antonio ALC began operating its Logistics Readiness Center around-the-clock, put its surge contingency plan into effect, and implemented the base mobility plan. Other emergency and wartime plans went into effect within the month as the demand for troops and material grew. To keep center personnel up-to-date on the activities of the center, the base Public Affairs Office began publishing a weekly Desert Shield Digest. Maintenance workers accelerated repairs to C-5 and B-52 aircraft, operating around-the-clock seven days a week. The pace of repair for TF39 and F100 engines increased. By the end of January, Kelly maintenance personnel had put in 23,000 hours of overtime in support of Desert Storm, and the level of effort showed no signs of slowing. In many offices, television sets or radios tuned to news stations provided a steady background of information on events.

Perhaps the most surprising development was the fact that the allied build-up in Saudi Arabia was unhindered by Iraqi action. As the threat of an invasion of that oil rich kingdom faded, the prospect of an assault on the Iraqi troops dug in along the southern border of Kuwait loomed ever larger. But equally surprising was the willingness, however reluctantly, of the Soviet Union to accept and verbally support the coalition effort. For the first time since the end of World War II, the United Nations was in a position to take united action against an aggressor nation.



Kelly people's work on F100, TF39, and T56 engines was so successful that not one fighter, attack, or transport aircraft missed a sortie during Desert Storm because of a lack of Kelly-furnished spare parts.

By mid-October the flow of supplies and munitions out of Kelly was moving so smoothly that officials reduced operations in the readiness center to twelve hours during the week and eight on weekends. For a time the pace of events seemed to slow as various diplomatic manuevers dominated the news, but American and allied troop strength in the Gulf continued to grow. In early November another 150,000 American troops were sent to the region. Call-up of Reserve and National Guard units continued. Then, on November 29, the United Nations Security Council voted to give Iraq six weeks to withdraw. Following that date, the coalition would be free to undertake military action. A final flurry of diplomatic moves followed, with Secretary of State James Baker unsuccessfully attempting to set up a meeting with Iraqi leader Saddam Hussein and United Nations Secretary General Javier Perez de Cuellar flying to Baghdad for a last ditch effort to avert fighting. Americans listened and watched as Congress solemnly debated the commitment of U. S. troops, a step authorized on January 12, 1991. Effectively the die was cast.

Desert Storm

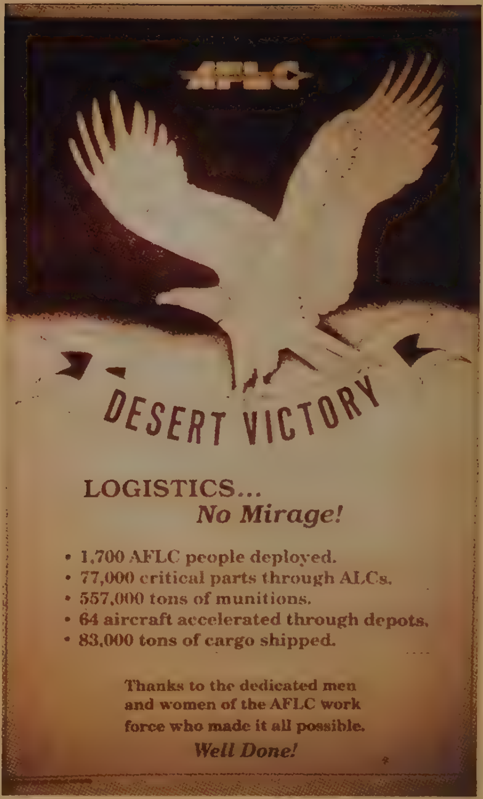
The deadline for the start of military operations was January 15. It passed without any action, and for a moment the tension eased. Then, around midnight on the night of January 16, Baghdad time, the allies struck. It was about six o'clock in San Antonio when the news of the first Allied air strikes reached workers just sitting down to their evening meal, and within moments Kelly was galvanized into activity. Tightened security went into effect immediately. Traffic jams backed up at the gates as security police checked individual identification cards. Once again, radios and television sets were tuned to news stations.

The air war over Iraq went on for five weeks. The moment most awaited and feared came on February 23 when allied ground forces began their assault. Incredibly, Iraqi resistance collapsed with stunning speed. One hundred hours after it began, the ground war ended with a ceasefire. The Iraqi army was completely beaten; Kuwait was liberated; and Saddam Hussein forced to agree to twelve United Nations resolutions--agreeing, among other issues, that the invasion had been wrong and accepting financial responsibility for the destruction to Kuwait's oil fields. It was a stunning military achievement.

Return of the First Desert Storm Troops

Excerpts from an Interview with Maj. Gen. Richard D. Smith

The first Desert Storm aircraft was an Army unit, a 747 coming in, scheduled at about 8:00 p.m. the first night. We hadn't laid any plans, really, for them to come back; we only found out it was coming in two days before. I checked with Fifth Army, who was going to receive the troops. They were going to put them on buses and take them over to Fort Sam Houston. I called the commander, confirmed this, and said, "That's not what we really want to do. We don't want them to ride a bus, for God's sake. In fact, we'll make it an Army show. Let's have it in building 1610, the same building we had received casualties in.'" General George Stotzer, Fifth Army Commander, said, "You're absolutely right; let's do it. " So we set it up out at the airfield in the evening. The airplane wouldn't get in until late; the Army Reserve outfit went out there and set up. There were literally thousands of people to meet the troops ; there were 457, if I recall, on the airplane. I won't say logistically that we did it all right because we didn't have places to take their weapons and all these kinds of things.



LOGISTICS...
No Mirage!

- 1,700 AFLC people deployed.
- 77,000 critical parts through ALCs.
- 557,000 tons of munitions.
- 64 aircraft accelerated through depots.
- 83,000 tons of cargo shipped.

Thanks to the dedicated men
and women of the AFLC work
force who made it all possible.
Well Done!

WELCOME HOME
DESERT STORM TROOPS
JOB WELL
BUTT!

The air was electric from 8:00 o'clock on. With a six-hour wait, we tried to get the word out to people that the airplane was going to be late, but there were still people waiting at the hangar at 8:00 -- virtually a full crowd. For three hours we probably had about two thousand people, and they all had their flags at their side. They'd put big signs up over the walls and doors that said, "Welcome Home," and "You kicked butt." They'd hung an American flag out in the back. The Army band sat outside and played music and gave concerts. We had Coke and hot dogs and things for the kids , and I wandered around and talked to them, and they were all excited because the men were coming home. The airplane came in and landed about 2:00 a.m., and when it landed, as it turned down at the end of the runway, it came back and taxied in, and they opened up the canopy and put a great big American flag on it. The follow-me truck went out there and it had an American flag and a Texas flag on the back, and it brought the airplane to its chocks, and, of course, the crowd cheered when the airplane touched ground, and it cheered when they did the chocks.

We put the stairs up against the plane and all the Pan-Am stewardesses came down; each one of them had an American flag, and they lined the steps of the airplane. General Stotzer and I went up on the airplane to give the returning men their systems briefing. The band played "God Bless America," and when we looked back at the lights on the hangar and the crowd there, people cheering and waving flags, the music, the signs welcoming the troops home, and all of it-- it was extremely moving. We went into the airplane and gave our briefing -- 'You go home with your families; you can pick up your bags in two or three days. If you don't have families we have buses to take you over to Fort Sam Houston to spend the night." It was a Thursday and we wanted them to report in on Monday and we told them what was going to happen with their unit. And, after we finished, the commander, who was an Army colonel, got on the speaker system and asked everybody to stand and he said, "I want Vietnam vets off the airplane first. We're home."' I don't think I've ever been as moved as when I saw the men getting off the plane. We repeated that fourteen times; we welcomed them all that way.

WE SUPPORT DESERT SHIELD
BON VOYAGE

The Kelly peoples' support for American troops was heartfelt.

Kelly's Gulf Support

The logistics effort in support of American deployment to the Persian Gulf was enormous by any measure. Half a million troops were on the ground by the end of the ground fighting, supported by hundreds of aircraft, and backed by millions of tons of supplies. The San Antonio Air Logistics Center played a key part in this effort, overhauling ten C-5 aircraft and five B-52s ahead of schedule and accelerating the repair of critically needed engines. In addition, the center shipped out over seventeen million pounds of munitions aboard 283 aircraft, supported the deployment of over 4,600 passengers, surged over 72,000 items requisitioned by American and Allied air bases, and procured over 915 million gallons of aviation fuel. In one specific instance, Kelly first learned of the immediate requirement for a multi-man cooling system (vital if the Iraqis used chemical weapons) in August, delivered the first lot in September, and completed production in December. What would take seven years under normal cicumstances took just five months.

Many of Kelly's people did more than coordinate logistic support. One hundred and thirty-one ALC personnel deployed to the Gulf, including members of the 2851st Security Police Squadron and the 2954th Combat Logistics Support Squadron, while another 329 members of associated units went to the Gulf from Kelly. Over 200 Kelly workers were called to active duty as part of activated Reserve or National Guard units. As they had so often in the past, Kelly's men and women had once more responded when called. And, upon reflection, the center was grateful for the long, hard round of exercises they had gone through the year before. Practice, in this case, made perfect.

Toward the Future

Overshadowed by the national euphoria over the dramatic victories in Operation Desert Storm, the same factors already forcing changes in the

American military structure continued to operate. Even as the troops in the Gulf began coming home, Pentagon planners were preparing for major cuts in strength and funding. With the threat of short-notice global war receding, planners were formulating a new series of strategies based on the development of "crisis response" forces instead of the forward defense posture utilized over the previous forty-five years. The goal was to provide as much flexibility as possible within the tight budgets of the future and involved a complete restructuring of the existing military command organization. None of the services was entirely happy with this approach; fears about the erosion of readiness were coupled with the psychological trauma of dealing with large cuts. But there were no other real choices; the cuts were coming and the services would have to deal with them.

As part of this planning, the Air Force anticipated keeping only three fighter wings in Europe and a similar number in the Pacific. In contrast to the Army and Navy, most of the Air Force cuts aimed at the active-duty forces. By the mid-1990s, Air Force planners anticipated having fifteen active-duty wings and eleven Reserve or Air National Guard wings. Beyond this, Air Force Chief of Staff General Merrill McPeak favored the creation of so-called composite wings, combining tactical, strategic, and support aircraft in the same organization in order to provide maximum flexibility. For the same reason, Strategic Air Command, Tactical Air Command, and Military Airlift Command were to be restructured into only two commands, initially labeled "Air Mobility Command" and "Air Combat Command." How this type of restructuring would change overall numbers was an open question, but at minimum by 1997 the Air Force expected to lose 4,800 military personnel and at least 20,000 civilian employees.

The Impact on Kelly

Altering the number, size, and organization of operational units would inevitably have an impact on the San Antonio Air Logistics Center. A smaller Air Force would have less need for maintenance and supply support. At the same time, the changes being wrought through the DMR would continue to force the center to modify its way of doing things. Smaller work loads and streamlined operations offered the unappetizing prospect of eliminating jobs or, at the least, limiting the number of higher ranking positions open to employees.

Kelly's future depended on highly skilled and capable work force.

Aerial of the San Antonio Air Logistics Center, 1991

Yet the picture was not entirely bleak. A plan to upgrade the F100 engines of the F-15 and F-16 fleets to a single standard promised a continuation of F100 work for the foreseeable future, and the heavy use of C-5 transports also meant a continuation of TF39 engine and C-5 maintenance work loads--both a large part of the center's traditional responsibilities. Moreover, Kelly was an important element in the ongoing computer revolution within the Air Force. Local computer specialists were making tremendous strides in the development of artificial intelligence and "expert systems," programs that guided workers through specific processes in everything from repair work to administration. These were all signs that fundamentally the center was on the proper course, its people and organizations reacting with vigor and innovativeness to the changing environment of the 1990s.

Thus, as Kelly approached its seventy-fifth anniversary, it faced the future with guarded optimism. While many reminders of the past were visible on the base in the form of buildings and static displays, Kelly was in the process of transforming itself into a more efficient, modern facility, capable of handling new and unknown challenges.

Change is always unsettling, but over its history Kelly had seen many changes. What remained constant was the determination of its people to carry on the heritage of service that had always been Kelly's hallmark. That, at least, would not change, and it is a legacy that Kelly people carry proudly forward into the future.

Texas Air National Guard
149th Tactical Fighter Group

The Texas Air National Guard's 149th Tactical Fighter Group began as the 182nd Fighter Squadron on October 6, 1947, at Brooks Field, a direct descendant of the 396th Fighter Squadron, activated in June 1943. The 396th served in Europe during World War II, flying missions over Normandy, Northern France, Belgium, and the Rhineland in Germany.

The 182nd began flying P-51 "Mustangs" in 1947 and accepted its first jet fighter, the F-84E "Thunder Jet," when the squadron returned to active duty during the Korean War. As a part of the 136th Fighter Wing, the 182nd was the first Guard squadron to see combat during the Korean War, the first Guard unit to shoot down a MIG-15, and the first to prove the concept of aerial refueling during combat.

In 1960, when new squadrons and a headquarters staff were added, the 182nd was redesignated as the 149th Fighter Interceptor Group, with the 182nd Fighter Interceptor Squadron as one of its subordinate units. The group moved to its new home on Kelly AFB as the runway at Brooks closed.

The Group's aircrews have flown a wide variety of fighters over the past forty years including F-80 "Shooting Stars," F-86 "Sabre Jets," F-102 "Delta Daggers," F-100 Super Sabres," and F-4C "Phantoms." The 149th converted to F-16 "Fighting Falcons" during the latter half of the 1980's.

P-51 "Mustang"

More than 1,100 men and women comprised the 149th and proudly served in two important roles. In times of war, the unit served the nation as a ready and able fighting force, poised to mobilize and carry out the mission of preserving peace. In times of peace, the 149th assisted communities throughout the state of Texas by providing medical support, emergency communications, search and rescue operations, and a variety of other vital services.

The 149th converted to F-16 "Fighting Falcons" during the latter half of the 1980's.

The Alamo Wing

On October 17, 1951, 200 Air Force reservists gathered on Brooks Air Force Base to form the 907th Pilot Training Wing, christened the "Alamo Wing." Two years later, the 907th was deactivated; its personnel and nickname went to the 8707th Pilot Training Wing, where aircrews flew C-46 "Commandoes," C-45 "Voyagers," AT-6 "Texans," and T-28 "Trojans." In 1955, the 8707th deactivated, and its personnel assigned to the newly reactivated 433rd Troop Carrier Wing, which became the new Alamo Wing. Its aircrews now flew C-119 "Flying Boxcars." When the runways at Brooks AFB closed for the last time in 1956, the Alamo Wing moved to its new home and present location - Kelly Air Force Base.

Beginning in 1966, the Alamo Wing replaced its aging C-119s with the C-124 "Globemasters." A year later, on July 1, 1967, the 433rd became a tactical airlift wing. During the reserve recall during the Pueblo Crisis in 1968, the Alamo Wing was reassigned to the Miltary Airlift Command. In 1971, the Alamo Wing began flying the workhorse of the Air Force, the reliable and versatile C-130 "Hercules." With the C-130, the wing flew humanitarian missions, fought forest fires, and participated in exercises in Greece and Panama.

In 1984, the biggest announcement in the wing's history came out of Washington, D.C. -- the Alamo Wing would be the first unit in either the Air Force Reserve or the Air National Guard to be assigned the giant C-5 "Galaxy." In keeping with the C-5's global mission, the Alamo Wing became the 433rd Military Airlift Wing. The first of the huge birds arrived in December 1984 and appropriately was named "The City of San Antonio." Aircrews of the Alamo Wing continued its humanitarian missions, transporting tons of food, firefighting and farm equipment, and emergency relief supplies all around the world.

But the Alamo Wing performed its primary mission, also. In December 1989, as American forces moved against the Panamanian dictator Manuel Noriega, Alamo Wing reservists were among the first to go into action during Operation Just Cause. Less than a year later, reservists of the Alamo Wing heard their country call yet again as wing personnel were involved in Operation Desert Shield from the beginning, providing airlift support to the area of operations in Southwest Asia. Aircrews flew nearly 2,500 sorties with approximately 13,500 flying hours, hauling more than 61,000 tons of cargo and 31,000 passengers.

The greatest sacrifice occurred early in the deployment when a C-5 flown by an Alamo Wing crew crashed during take-off in Germany while transporting supplies to Saudi Arabia. Of the seventeen people aboard, nine of the wing's crew members and four passengers were killed. From just a few hundred reservists in 1952, the Alamo Wing has more than 3,500 dedicated men and women who have proved time and again that they are true to the Air Force Reserve motto, "Ready Now!"

Air Force Intelligence Command

The Air Force Intelligence Command provided electronic combat support and operations security to Air Force units worldwide and furnished direct intelligence support to the Air Force, Joint and Allied commanders and national agencies to help them perform their missions. The command traced its origins to 1948 and the establishment of the United States Air Force Security Service (USAFSS), which provided cryptologic support for the fledgling Air Force. Several months later, the Army transferred three mobile radio squadrons (one each in Germany, Japan, and the continental United States) and a radio security section to USAFSS. In May 1949, the Headquarters moved to Brooks Air Force Base in San Antonio and later moved into its new building on Kelly in 1953. In 1958, USAFSS assumed base support functions at a number of locations throughout the world.

Early in 1967, as the tempo of the war in Vietnam increased, USAFSS picked up another role, that of a central evaluating agency for all Air Force electronic warfare activities. This mission increased in importance during the 1970s, and USAFSS activated a new Air Force Electronic Warfare Center at Kelly as a result. On October 1, 1978, USAFSS ended twenty years of base management when it transferred responsibility for its last four overseas bases to the theater commands. Three months earlier, it handed over responsibility for cryptologic training, located at Goodfellow Air Force Base, Texas, to the Air Training Command.

On August 1, 1979, the United States Air Force Security Service changed its name to the Electronic Security Command (ESC), reflecting a new command, control, and communications countermeasures tasking and broader electronic warfare responsibilities. In 1985, ESC picked up another new mission, computer security, with the transfer of the Air Force Computer Security Office from Gunter Air Force Station, Alabama, to Kelly.

Twelve years later, on October 1, 1991, the command was redesignated yet again, becoming the Air Force Intelligence Command when the people and missions of ESC combined with those of the Air Force Foreign Technology Division from Wright-Patterson Air Force Base, Ohio; the Air Force Special Activities Center at Fort Belvoir, Virginia; and elements of the Air Force Intelligence Agency in Washington, D.C., to form one single command.

Air Force Commissary Service

At the end of World War II, each of the military services made its own regulations for commissaries -- stores that sold grocery items to its personnel and family members. With the establishment of the Department of Defense in 1947, some form of centralization was inevitable within the Air Force. The major commands set their own commissary operating policies and procedures, with each base managing its own store. This was usually not cost effective and often became counterproductive with substandard facilities, remote site delivery problems, poor service, and the inability of small stores to receive price reductions based upon sales volume. A 1975 Defense Department study attributed these shortcomings largely to the lack of professional training, standardized procedures, and a centralized organization.

As a result, the Defense Department established the Air Force Commissary Service (AFCOMS) in January 1976 to overcome these problems within the Air Force. The headquarters, located on East Kelly, began operating with a small cadre of key personnel in April before officially assuming control of all Air Force commissaries on October 1, 1976.

Following its establishment, AFCOMS began building new facilities and modernizing its existing stores. By 1989, of 145 Air Force commissaries in operation, seventy-five were new. State-of-the-art methods of grocery management, scanners and computerized inventory methods, were used to cut costs and streamline operations. The headquarters staff managed the wartime subsistence mission and peacetime operation of commissaries as well as interfacing with local and national vendors to obtain discounts, promotions, and the best prices possible. But the tide of centralization did not stop with just consolidated operations within one service. Congressional budget cutbacks forced the Defense Department to look at centralizing all commissary operations. On October 1, 1991, AFCOMS officially consolidated with the commissary functions of the other services to form the new Defense Commissary Agency, headquartered at Fort Lee, Virginia.

The Air Force had pushed to locate the new agency's headquarters at Kelly. While that did not happen, the San Antonio location remained important. The former AFCOMS building on East Kelly became a regional headquarters for the new agency and included a service center that paid bills and salaries for all commissary operations located from the Mississippi River to Japan. While the organization changed, the mission remained the same -- providing the best rations available to American service members and their families in war and peace.

Air Force News Center

In today's information age, another associate unit headquartered at Kelly, the Air Force News Center (AFNEWS) -- formerly the Air Force Service Information and News Center -- played a major role in keeping Air Force members and their families worldwide informed on important Air Force programs and policies.

The center created and furnished public affairs products and services through several programs: the Air Force Internal Information Program, which managed and operationally controlled the Army and Air Force Hometown News Service; the Air Force Broadcasting Service, which provided the people, equipment and coordination necessary to get curent news and entertainment programs to overseas audiences; the Internal Information Directorate, which handled news mediums that include magazine and newsletter formats, radio programs, letters and colored lithographs; and the Air Force Hometown News Center. Additional functions of AFNEWS included providing budgetary, supply and administrative support for the Air Force Orientation Group at Gentile Air Force Station, Ohio; and Air Force Regional Public Affairs Offices in Chicago, Los Angeles and New York City.

The importance of AFNEWS came to the fore during Operation Desert Shield/Desert Storm, when its personnel set up and operated the Air Force Desert Storm hotline. With the twenty-four hour information line, over 60,000 callers got news about family and friends serving in the Persian Gulf region, getting reassurance from a "real" person instead of a recorded message.

On October 30, 1991, AFNEWS held a groundbreaking ceremony on East Kelly, symbolizing the end of planning and the start of construction on a new $4 million headquarters building. When completed, more than 160 people currently located in three separate buildings on Kelly will be able to move into the single, 40,000 square-foot facility and perform their job of keeping the Air Force informed more efficiently and effectively.

SrA. John Davis, Air Force Radio News, interviews a security policeman after a firefight near the end of the flight line during Kelly AFB readiness exercise Battle Axe 91-4.

Commanders of the San Antonio Air Logistics Center

and its Predecessors

1918 through 1991

Maj. George H. Brett
19 Dec 1918 - 21 Feb 1919

Maj. William H. Garrison, Jr.
21 Feb 1919 - 24 Jul 1922

Maj. Frank D. Lackland
24 Jul 1922 - 18 Jun 1926

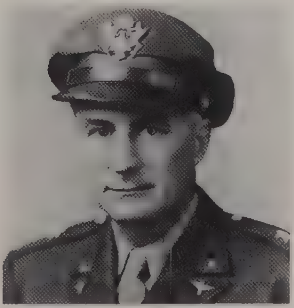
Maj. J. H. Pirie
2 Jul 1926 - 19 Mar 1927

Lt. Col. James A. Mars
2 Jun 1927 - 12 Jul 1929

Maj. Augustine Warner Robins
12 Jul 1929 - 3 Nov 1931

Lt. Col. A. G. Fisher
3 Nov 1931 - 15 Jun 1934

Col. John H. Howard
15 Jun 1934 - 8 Jul 1937


Lt. Col. Henry J. F. Miller
8 Jul 1937 - 10 Mar 1941

Lt. Col. Clements McMullen
10 Mar 1941 - 12 Jan 1942

Col. Delmar H. Dunton
12 Jan 1942 - 8 Jun 1942

Brig. Gen. Paul C. Wilkins
8 Jun 1942 - 10 Jan 1944
25 Mar 1944 - 1 Apr 1944

Brig. Gen. Arthur W. Vanaman
10 Jan 1944 - 24 Mar 1944
2 Apr 1944 - 21 May 1944

Col. Thomas H. Chapman
22 May 1944 - 2 Jul 1944

Brig. Gen. Morris Berman
3 Jul 1944 - 18 Nov 1944

Col. John S. Laird, Jr.
19 Nov 1944 - 10 Apr 1945

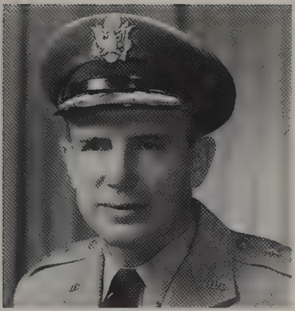
Brig. Gen. George H. Beverley
10 Apr 1945 - 14 May 1947

Col. Lewis A. Dayton
14 May 1947 - 3 Aug 1947

Brig. Gen. Robert K. Taylor
3 Aug 1947 - 6 Jan 1948

Maj. Gen. James S. Stowell
6 Jan 1948 - 16 Oct 1948

Maj. Gen. Clements McMullen
22 Oct 1948 - 28 Feb 1954


Maj. Gen. Thetus C. Odom
1 Mar 1954 - 3 Jan 1959

Brig. Gen. Lewis Mundell
3 Jan 1959 - 20 Aug 1960

Brig. Gen. Dor E. Newton, Jr.
20 Aug 1960 - 30 Aug 1960 (Actg)

Maj. Gen. William T. Hudnell
30 Aug 1960 - 1 Jun 1965

Col. Conrad J. Herlick
1 Jun 1965 - 14 Jul 1965 (Actg)

Maj. Gen. Frank E. Rouse
15 Jul 1965 - 31 Mar 1969

Maj. Gen. William H. Reddell
1 Apr 1969 - 31 Jul 1972

Maj. Gen. William A. Jack
1 Aug 1972 - 31 Jul 1974

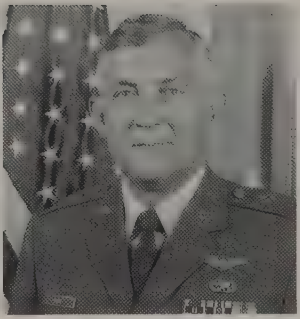
Maj. Gen. John R. Kelly, Jr.
1 Aug 1974 - 30 Jun 1977

Maj. Gen. Lynwood E. Clark
1 Jul 1977 - 15 Mar 1981

Maj. Gen. Earl T. O'Loughlin
17 Mar 1981 - 7 Jun 1982

Maj. Gen. Waymond C. Nutt
8 Jun 1982 - 24 Sep 1985

Maj. Gen. Lewis G. Curtis
26 Sep 1985 - 30 Jun 1989


Maj. Gen. Richard D. Smith
1 Jul 1989 - Present

Base Commanders

of

Kelly Field and Kelly Air Force Base

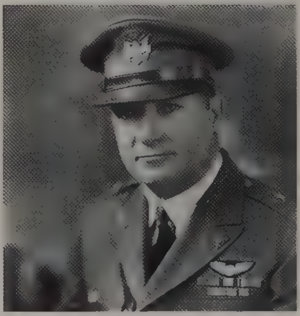
Capt. Thomas S. Bowen
11 May 1917 - 28 May 1917

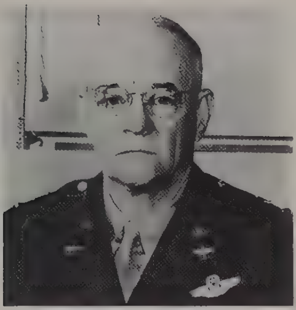
Capt. Seth W. Cook
29 May 1917 - 10 Jun 1917

Col. Charles Tayman
11 Jun 1917 - 2 Jul 1917

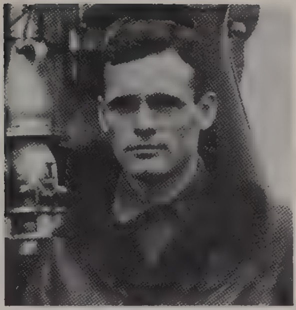
Col. William D. Chitty
18 Sep 1917 - 24 Mar 1918

Lt. Col. G.V.S. Quackenbush
24 Mar 1918 - 9 May 1918

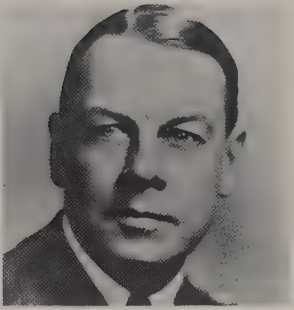

Col. William E. Gillmore
10 May 1918 - 20 Nov 1918



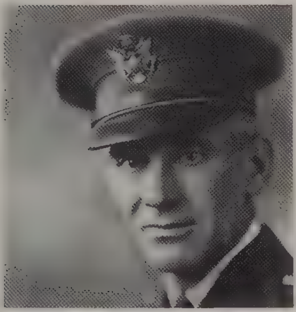
Lt. Col. Henry B. Clagett
20 Nov 1918 - 21 Dec 1918
20 Oct 1931 - 1 Mar 1935



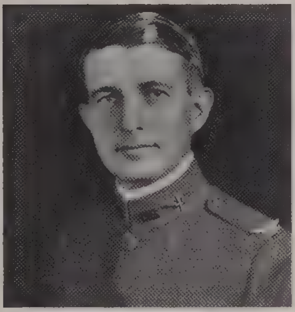
Lt. Col. Joseph E. Carberry
22 Dec 1918 - 7 Jan 1919



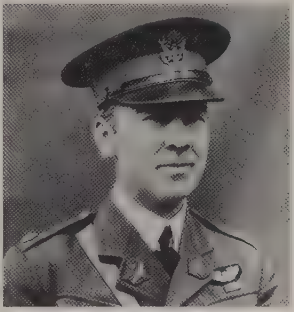
Col. Henry C. Pratt
15 Jan 1919 - 15 Mar 1919
8 May 1920 - 25 Aug 1920



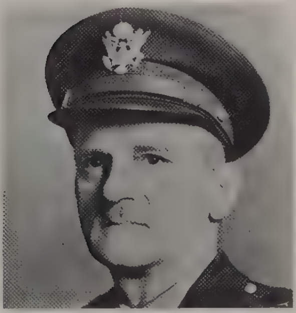
Col. James E. Fechet
15 Mar 1919 - 31 May 1919
24 Jul 1924 - 5 Apr 1925



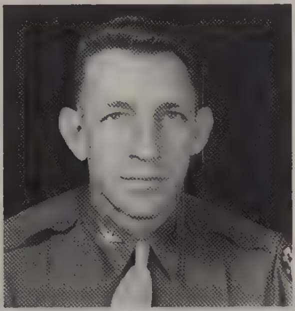
Col. Archie Miller
3 Mar 1920 - 4 Aug 1920



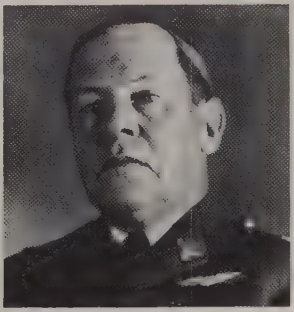
Maj. Jenner Y. Chisum
25 Sep 1920 - 4 Oct 1920



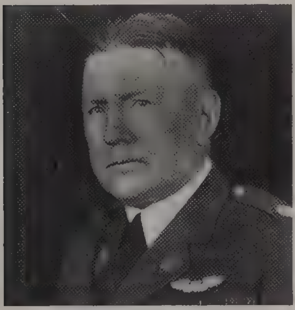
Maj. Carl "Toohey" Spaatz
5 Oct 1920 - 17 Feb 1921



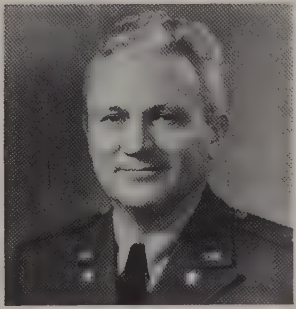
Maj. John N. Reynolds
18 Feb 1921 - 31 Jan 1922



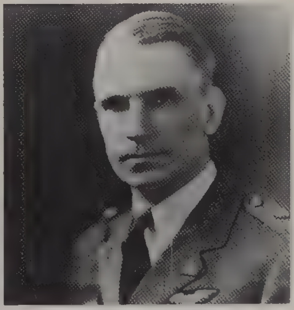
Lt. Col. John H. Howard
1 Feb 1922 - 3 Jul 1924



Lt. Col. C. Culver
14 Apr 1925 - 14 Jun 1926



Maj. Frank M. Andrews
14 Jun 1926 - 15 Jul 1927



Maj. James E. Chaney
15 Jul 1927 - 7 Aug 1930

Maj. Frederick L. Martin
7 Aug 1930 - 20 Oct 1931

Col. Jackob E. Fickel
1 Mar 1935 - 3 Jun 1936

Maj. Thomas S. Voss
3 Jun 1936 - 6 Jun 1936

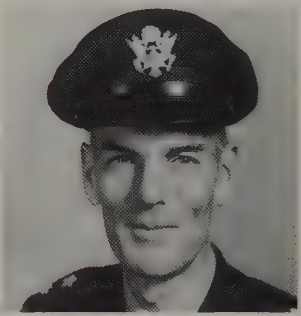
Maj. Wolcott P. Hayes
6 Jun 1936 - 27 Jun 1936

Col. Arnold N. Krogstad
27 Jun 1936 - 13 Mar 1938

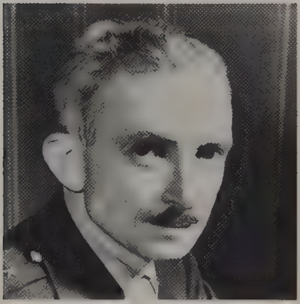
Col. Frank D. Lackland
13 Mar 1938 - 8 Jan 1940

Col. Eugene A. Lohman
8 Jan 1940 - 3 Aug 1940

Col. Harvey Prosser
3 Aug 1940 - 7 Sep 1940
3 Oct 1941 - 17 Sep 1942



Col. Hubert R. Harmon
7 Sep 1940 - 26 Sep 1941



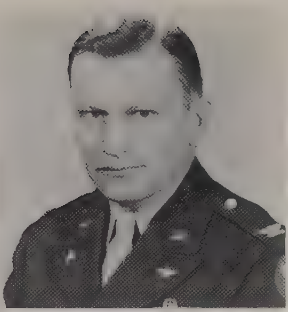
Lt. Col. Isaiah Davies
27 Sep 1941 - 3 Oct 1941

Col. Edwin Sullivan
17 Sep 1942 - 22 Sep 1942

Lt. Col. Sidney D. Grubbs
23 Sep 1942 - 11 Jan 1943

Lt. Col. Samuel B. Knowles
12 Jan 1943 - 11 Mar 1943

Lt. Col. Alexander G. Grieg
29 Mar 1943 - 24 Apr 1943



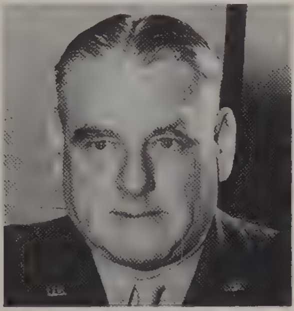
Col. Paul S. Blair
28 Apr 1943 - 15 Jul 1944

Col. Russell I. Oppenheim
15 Jul 1944 - 22 Aug 1944

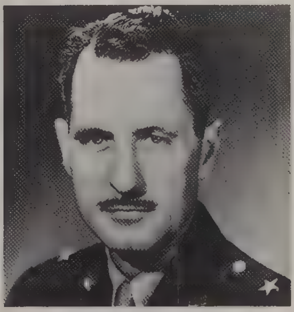
Col. John A. Laird, Jr.
23 Aug 1944 - 23 Oct 1944
10 Dec 1944 - 10 Apr 1945

Lt. Col. Frank H. Barber
23 Oct 1944 - 10 Dec 1944

*Brig. Gen. George H. Beverley
10 Apr 1945 - 14 May 1947



*Col. Lewis A. Dayton
14 May 1947 - 3 Aug 1947



*Brig. Gen. Robert K. Taylor
3 Aug 1947 - 6 Jan 1948

*Maj. Gen. James S. Stowell
6 Jan 1948 - 16 Oct 1948

*Maj. Gen. Clements McMullen
22 Oct 1948 - 1 Aug 1953

Col. Laurence A. Growden
1 Aug 1953 - 26 Jun 1954

*Between 9 Dec 1944 and 1 Aug 1953, ATSC/AMA commanders doubled as base commanders.

Col. Ben T. Stogner
27 Jun 1954 - 14 Aug 1954
28 Apr 1958 - 20 Jun 1958

Col. Henry O. Bordelon
16 Aug 1954 - 30 Sep 1954
12 Mar 1956 - 28 Apr 1958

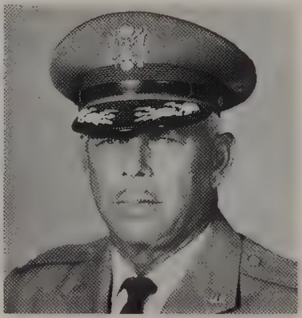
Col. Howard Moore
1 Oct 1954 - 19 Jul 1955

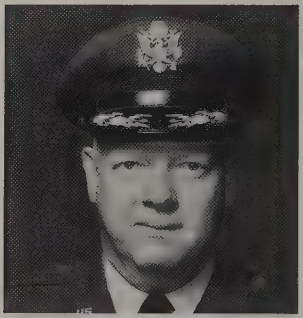
Col. Isaac M.B. Symes
20 Jul 1955 - 12 Mar 1956

Col. Irving C. Eells
20 Jun 1958 - 21 Jul 1959

Col. Curtis Frisbie
22 Jul 1959 - 11 Jul 1962

Col. Jack Whidden
12 Jul 1962 - 26 Aug 1962


Col. Howard J. Bechtel
27 Aug 1962 - 31 Dec 1966

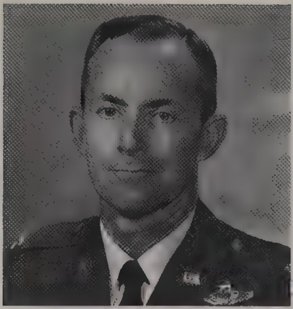

Col. Farley E. Peebles
1 Jan 1967 - 12 Jun 1967

Col. Benjamin H. Shiffrin
12 Jun 1967 - 31 Oct 1968

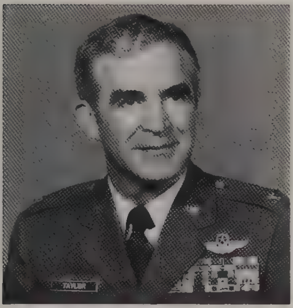
Col. Edison F. Arnold
1 Nov 1968 - 25 Dec 1970

Col. Harold K. Dorgan
26 Dec 1970 - 30 Jan 1972

Col. Joe Fry
31 Jan 1972 - 1 May 1973


Col. William I. MacLachlan
1 May 1973 - 23 May 1974

Col. Kenneth E. Harrison
23 May 1974 - 31 Jul 1975



Col. Harry W. Taylor, Jr.
1 Aug 1975 - 15 Aug 1976

Col. Myron G. Smith
16 Aug 1976 - 10 Jun 1977

Col. Everett M. Sutton
10 Jun 1977 - 30 Dec 1977

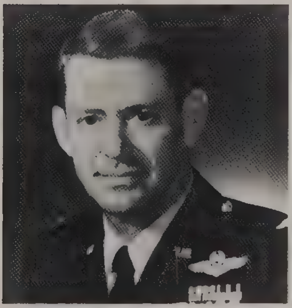
Col. Richard A. Bianckino
30 Dec 1977 - 27 Feb 1978

Col. Lester R. Mellott, Jr.
28 Feb 1978 - 14 Jun 1979

Col. Robert A. Manns
15 Jun 1979 - 22 Jun 1981

Col. John A. Webb
22 Jun 1981 - 21 Aug 1984

Lt. Col. Robert A. Miller
22 Aug 1984 - 24 Oct 1984

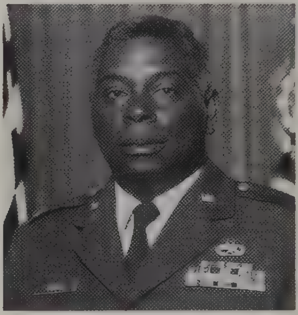

Col. Thomas O. Williams III
25 Oct 1984 - 18 Jun 1986

Lt. Col. Martin A. Donley
19 Jun 1986 - 18 Aug 1986

Col. Leslie A. Hobgood
19 Aug 1986 - 31 May 1989

Lt. Col. James Concannon
1 Jun 1989 - 16 Jul 1989

Col. James T. Jones
17 Jul 1989 - 18 Jul 1991


Col. Raymond Holmes
19 Jul 1991 - Present

Glossary

A	Attack Airplane
AAF	Army Air Forces
ADP	Automated Data Processing
AEF	American Expeditionary Force
AFB	Air Force Base
AFCOMS	Air Force Commissary Service
AFLC	Air Force Logistics Command
AFNEWS	Air Force News Center
AFSC	Air Force Systems Command
AGE	Aerospace Ground Equipment
ALC	Air Logistics Center
ALS	Advanced Logistics System
AMA	Air Materiel Area
AMC	Air Materiel Command
ARDS	Air Research and Development Command
AT	Advanced Trainer Airplane
ATC	Air Transport Command
ATSC	Air Technical Services Command
AUTODIN	Automatic Digital Network
AVDS	Aviation Depot Squadron
AWOL	Absent Without Leave
B	Bomber Airplane
BC	Basic Combat Airplane
BT	Basic Trainer Airplane
C	Cargo Airplane
CH	Combat Helicopter
Cpl	Corporal
CPSB	City Public Service Board
CY	Calendar Year
DC	Douglas Company Commercial Airplane
D.C.	District of Columbia
DH	DeHavilland Light Bomber Airplane
DMMIS	Depot Maintenance Management Information System
DMR	Defense Management Report
DMR	Defense Management Review
DMRD	Defense Management Review Decision
E	Electronics Airplane
ECP	Engineering Change Proposal
EEO	Equal Employment Opportunity
EF	Electronics Fighter Airplane

F	Fighter Airplane; Photo-Reconnaissance Airplane
F	Fan Jet Engine
FAI	Federation Aeronautique Internationale
FMS	Foreign Military Sales
FY	Fiscal Year
G	Gravity
GHQAF	General Headquarters Air Force
GS	General Schedule
HQ	Headquarters
IBM	International Business Machines
ICBM	Intercontinental Ballistic Missile
IRAN	Inspect and Repair as Necessary
J	Jet Engine
JN	Curtiss Trainer Aircraft
JMA	Junior Military Aviation
JP	Jet Propulsion Fuel
KANNEX	Kelly Annex
KC	Tanker-Cargo Transport Airplane
L	Liaison Aircraft
L	Lockheed Corporation Commercial Airplane
LAN	Local Area Network
LB	Light Bomber Aircraft
LMS	Logistics Modernization System
LOGAIR	Logistics Airlift
Lt	Lieutenant
MAC	Military Airlift Command
MATS	Military Air Transport Service
MB	Martin Bomber
Mod/IRAN	Modification/Inspect and Repair as Necessary
Model R	Early Curtiss Trainer Airplane
NASA	National Aeronautics and Space Administration
NBS	Two-Seat Night Bomber-Short Distance
NOLS	Nuclear Ordnance Logistics System
O	Observation Airplane
OA	Observation Amphibian Airplane
ORI	Operational Readiness Inspection
OV	Observation Vertical Take Off and Landing Airplane
OX	Early Curtiss Aircraft Engine

P	Pursuit Airplane, Maritime Patrol Plane
PDM	Programmed Depot Maintenance
POW	Prisoner of War
PT	Primary Trainer
Pvt	Private
PW	Single-engine Pursuit Airplane with Water-cooled Engine
PW	Pratt and Whitney
QEC	Quick Engine Change
QP4	Quality = People + Process + Performance + Product
R	Reciprocating Engine
RAF	Royal Air Force
RDB	Requirements Data Bank
RIF	Reduction-in-Force
SAACC	San Antonio Aviation Cadet Center
SA-ALC	San Antonio Air Logistics Center
SAAMA	San Antonio Air Materiel Area
SAATSC	San Antonio Air Technical Service Command
SAC	Strategic Air Command
SACC	San Antonio Contracting Center
SARPMA	San Antonio Real Property Maintenance Agency
SDI	Strategic Defense Initiative
SE	Attack-Fighter-Trainer
Sgt	Sergeant
SORT	Special Overseas Repair Test
SPM	System Program Manager
St.	Saint
STAMP/STRAPP	Standard Air Munitions Pkg/Standard Tank, Rack, Adapter & Pylon
STAR	Streamlining/Transitioning ALC Resources
STRIDE	System Program Management, Technical Infusion, Reorganization Initiative, Integrated Planning, Development and Acquisition, and Engineering Management
T	Trainer Aircraft
T	Turbo-prop Engine
TF	Turbo-fan Engine
TCTO	Time Compliance Technical Order
TQM	Total Quality Management
TRC	Technology Repair Center
U	Utility Airplane
UN	United Nations
US	United States
USAA	United Services Automobile Association
USAF	United States Air Force

USAFSS	United States Air Force Security Service
V	Early Watercooled Aircraft Engine
VJ Day	Victory in Japan
WAC	Women's Army Corps
WPA	Works Progress Administration
XB	Experimental Bomber Airplane
XC	Experimental Cargo Airplane

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